Fisheries and Oceans Canada
Pêches et Océans Canada

Horizontal Evaluation of Funding Dedicated to Whales

FINAL REPORT
March 21, 2023

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Canada

Evaluation

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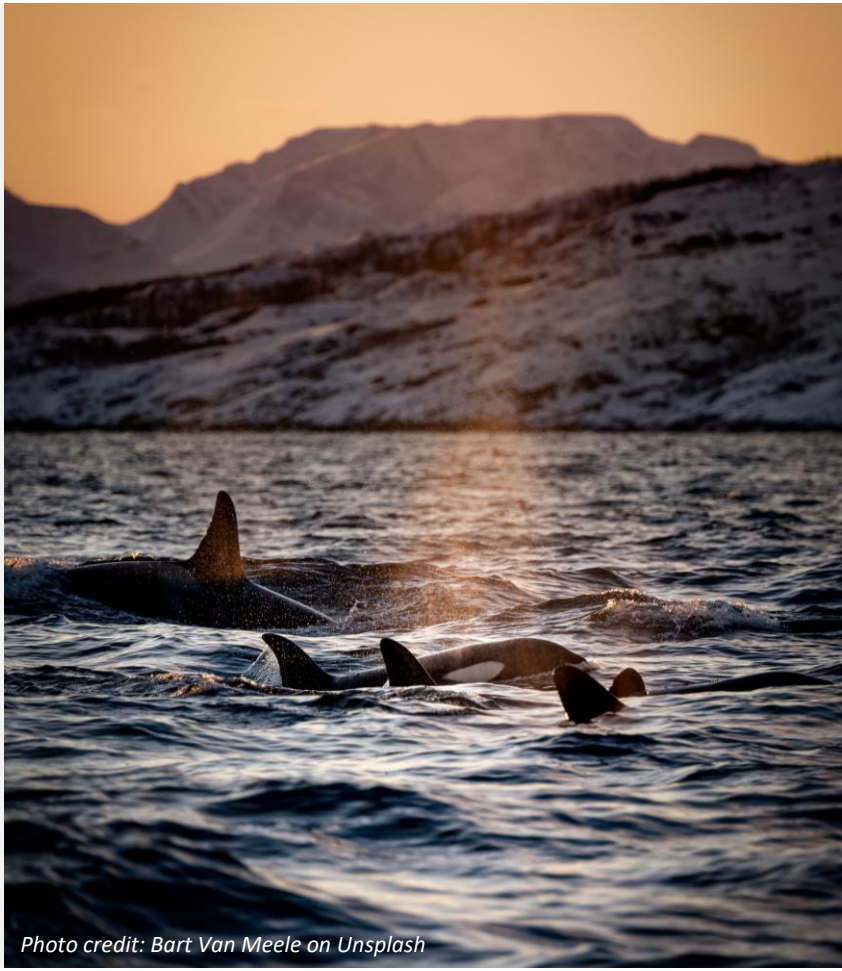

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Evaluation context: objectives and scope

The Horizontal Evaluation of Funding Dedicated to Whales was led by Fisheries and Oceans Canada's (DFO) Evaluation Division in collaboration with three other federal partner departments and agencies (PDAs) that have responsibilities for the delivery of whale protection and recovery measures:

- Transport Canada (TC);
- Parks Canada (PC); and
- Environment and Climate Change Canada (ECCC).

The evaluation was conducted between May and November 2022. It complies with the Treasury Board Policy on Results and responds to a requirement to conduct an evaluation of Southern Resident killer whale measures by March 2023.

Objectives and scope

The objective of the evaluation was to provide senior management with evidence-based information to support decision-making. The scope of the evaluation was established through a planning phase, which included document review, file review, scoping discussions with program representatives from all four PDAs, and a consultation with DFO's Performance Measurement and Evaluation Committee.

The evaluation was designed to provide evidence on what worked well and where improvements could be made with respect to the protection and recovery of three endangered whale species: the North Atlantic right whale (NARW), the Southern Resident killer whale (SRKW), and the St. Lawrence Estuary beluga (SLEB). It included an assessment of design and delivery, progress on addressing threats, and lessons learned for future programming for the time period from 2017-18 to 2021-22.

The scope of the evaluation did not include an assessment of the specific programs or initiatives that have some responsibilities for whale-related programming [e.g., the Species at Risk Program (SARP), Canada's Nature Legacy], although some whale-related activities undertaken as part of recovery strategy and action plans may be reflected in the report. In addition, the evaluation did not cover any Arctic regions because no whale protection and recovery activities have been funded to-date in those regions.

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Evaluation context: methodology

Evaluation questions

The evaluation examined eight questions related to design and delivery, progress on addressing threats, and lessons learned for future programming.

Design and delivery

1. To what extent were activities aligned with departmental programs, priorities, and mandates?
2. To what extent were the activities:
   a. implemented as planned;
   b. appropriate to achieve intended results; and
   c. flexible to allow for course corrections as needed?
3. What internal or external factors enabled or hindered PDAs' abilities to achieve the intended results?
4. To what extent was there Indigenous involvement in whale-related programming?

Progress on addressing threats

5. To what extent was progress made to address threats [i.e., disturbance (acoustic and physical), vessel strikes, entanglements, prey availability and quality, and contaminants] to the targeted species?
6. To what extent have activities contributed to progress in achieving desired outcomes as defined by Indigenous communities and groups (if applicable)?

Lessons learned for future programming

7. Were there any unintended impacts, either positive or negative, as a result of whale-related programming?
8. How can the effectiveness and/or efficiency of participating departments and agencies be improved going forward in terms of whale-related programming?

Data collection methods

The evaluation used multiple lines of evidence, as shown below. For full details on the evaluation methodology, including limitations, see Appendix A.

Four specifically selected activities were examined in-depth to understand the achievement of results and lessons learned: voluntary slowdown measures, marine mammal response providers, whale-related aerial surveillance and whalesafe fishing gear / technologies (see Appendix C for more detail).

[1] Ninety-four responses were received from internal staff; 52 responses were received from experts in fields related to whale protection and recovery.
[2] A case study was undertaken on Indigenous involvement in the SRKW Initiative in British Columbia. Results from the case study are presented throughout the report and Appendix B provides a full report on the case study.

Profile of whale-related initiatives

Overview of funded initiatives

Starting in 2017, the Government of Canada made investments to help protect and support the recovery of three endangered whale species: the NARW, the SRKW, and the SLEB. For more information on these species, see Figure 1 on the following page. These investments were made through four key initiatives and projects delivered by DFO/the Canadian Coast Guard (CCG), TC, ECCC, and PC.

Oceans Protection Plan (OPP)
2017-18 to 2021-22

Marine Environmental Quality and Whale Detection and Avoidance

Focus on understanding the impact of shipping-related noise on the SRKW, NARW, and SLEB and on testing whale detection technologies to reduce the risk of vessel strikes.

Delivered by DFO and TC

Whales Initiative
2018-19 to 2022-23

Address human-induced threats for SRKW, NARW, and SLEB in support of the implementation of *Species at Risk Act* recovery strategies and action plans for these species.

Delivered by DFO, ECCC, and TC

SRKW Initiative
2019-20 to 2023-24

Extend the Whales Initiative for the SRKW species, building on the reporting structure already in place while addressing threats to SRKW on a broader and faster scale.

Delivered by DFO, ECCC, TC, and PC

Trans Mountain Expansion (TMX)
2019-20 to 2021-22

Recommendations 5 and 6

Monitor, assess, and report, over time, on the extent to which the increase in Project-related underwater noise has been offset by the underwater noise measures and informed adaptive management of measures.

Delivered by DFO/CCG and TC

Spending on key whale-related programming

Table 1 provides an overview of the spending for the four whale-related initiatives/projects, which totaled $227.1 million between 2017-18 and 2021-22.

Other ongoing programing and initiatives, not included in this spending (e.g., SARP, Canada's Nature Legacy, and Enhanced Nature Legacy), also supported activities for the protection and recovery of marine mammals, including whales (e.g., Whalesafe Gear Adoption Fund and Ghost Gear Fund).

Table 1: Key whale-related initiatives/projects spending, in millions (2017-18 to 2021-22)

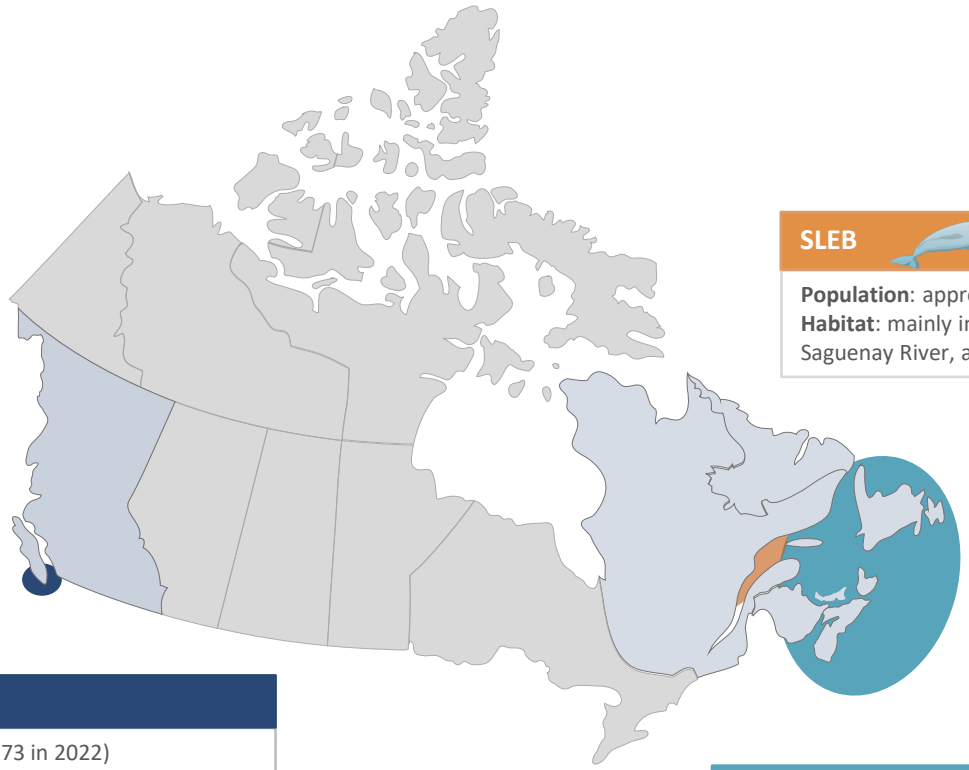
Initiative	2017-18	2018-19	2019-20	2020-21	2021-22
OPP – selected initiatives[3]	$9.6	$13.6	$11.6	$ 8.2	$7.5
Whales Initiative	-	$25.6	$40.7	$37.1	$32.9
SRKW Initiative	-	-	$7.0	$13.2	$11.3
TMX Recommendations 5/6	-	-	$3.9	$ 2.7	$2.2
Total	**$9.6**	**$39.2**	**$63.2**	**$61.2**	**$53.9**

Source: Departmental Results Reports (DRR) Horizontal Initiatives Supplementary information tables and internal financial information from each PDA.

[3] OPP also provided $4.5M in grants and contributions over four years (originally part of the Coastal Restoration Fund) for increasing capacity for safe and effective incident response, which is included in these OPP figures.

Profile of whale-related initiatives (continued)

Figure 1: Population and habitat of SRKW, SLEB, and NARW



SLEB

Population: approximately 900 (in 2022)
Habitat: mainly in the St. Lawrence River estuary, Saguenay River, and the Gulf of St. Lawrence

SRKW

Population: 70 to 80 (estimated as 73 in 2022)
Habitat: around the southern part of Vancouver Island

NARW

Population: approximately 340 (in 2022)
Habitat: Atlantic coast; known distribution and aggregation areas include the Gulf of St. Lawrence, Bay of Fundy and Roseway Basin

Source: *DFO website, recovery strategies and other reports.*

Profile of whale-related initiatives (continued)

Overview of funded activities and PDA responsibilities

As part of the investments, PDAs were responsible for a number of activities. These activities were funded to help mitigate threats that affect the survival and recovery of the endangered whale species: disturbance (acoustic and physical[4]), vessel strikes, and entanglements; prey availability and quality; and contaminants. Below is a high-level summary of the key funded activities for each of the PDAs and the threats they are intended to address.

Fisheries and Oceans Canada (Lead) / Canadian Coast Guard

- Implement fishery management measures such as changes to open/close dates, closure protocols and gear modifications for the prevention of entanglements, for minimizing physical and acoustic disturbance, and to support availability of prey, such as Chinook salmon.
- Deliver the Marine Mammal Response Program (e.g., disentanglements).
- Conduct compliance and enforcement activities (e.g., to monitor fishing activities and gear use, whale approach distances).
- Collect vessel traffic information for TC.
- Conduct public education/outreach.
- Conduct scientific research and monitoring on whale movements, habitat, behaviour, threats, and other aspects.

Transport Canada

- Manage vessel traffic (e.g., create vessel slowdown zones, vessel restricted areas, and manage shipping lanes).
- Conduct enforcement activities (e.g., issue interim orders and related compliance). Sometimes these are carried out by DFO fishery officers or PC park wardens on TC's behalf.
- Conduct surveillance on whale presence, including surveillance supported by DFO Conservation and Protection and Science.
- Conduct research activities on reducing underwater vessel noise and physical and acoustic disturbance of ships to marine mammals in busy shipping areas.
- Conduct public education and outreach and partner with various stakeholders in Canada and Internationally.

Parks Canada

- Protect and preserve national parks and marine conservation areas.
- Conduct research and monitoring offsite and within national parks reserves.
- Conduct outreach, education, engagement, and promotion with Indigenous communities and groups, and other stakeholders.
- Carry out compliance and enforcement activities within the national park reserves and within interim sanctuary zones under TC's jurisdiction.

Environment and Climate Change Canada

- Research, monitor, and assess contaminants that are harmful to whales, their prey, and their habitat.
- Prevent pollution and regulate and mitigate the release of contaminants.
- Conduct enforcement activities (i.e., inspections and investigations) and issue enforcement measures to prevent the release of harmful contaminants and hold polluters to account.

Disturbance (acoustic and physical), vessel strikes, and entanglements

Prey availability and quality

Contaminants

[4] Physical disturbance refers to the impacts of vessel or human presence in close proximity to whales, and which can affect their survival (e.g., interruption of feeding, which impacts energy intake; and altering socializing and breeding behaviours).

Evaluation findings

Design and delivery

Key findings:

- PDAs have the regulatory tools to effectively carry out their roles. Progress has been made on funded initiatives related to legislative and regulatory tools; however, some gaps and challenges remain.
- Funded activities to support the protection and recovery of the targeted species were well-aligned with the programs, priorities, and mandates of PDAs; and with international guidelines and practices of other jurisdictions.
- Some aspects related to the governance of whale-related activities were seen as successful, although some opportunities for improvement were identified.
- PDAs have undertaken a significant number of activities to support the protection and recovery of the targeted whale species, many of which were implemented as planned. Measures and activities were planned using an adaptive strategy, which allowed for adjustments to activities based on sound advice, science, and Indigenous and stakeholder input.
- PDAs faced some challenges during implementation, particularly with respect to COVID-19 and capacity, which affected the implementation of some planned activities.
- The three targeted whale species are significant to Indigenous Peoples' cultures, communities, and the ecosystems on which they rely. PDAs put processes in place to engage Indigenous communities and groups in whale-related programming; however, their degree of involvement in these processes varied. Several areas for improvement to the engagement and consultation processes were identified by Indigenous communities and groups.

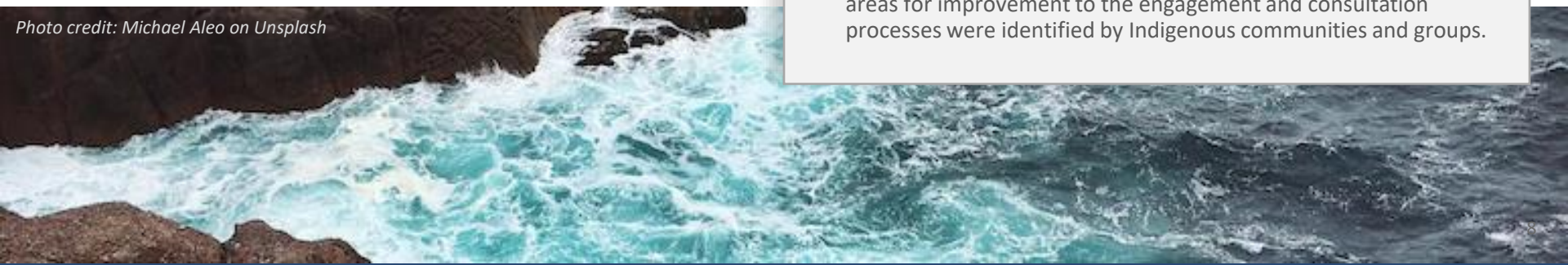


Photo credit: Michael Aleo on Unsplash

Legislative and regulatory tools for whale protection and recovery

PDAs have the regulatory tools to effectively carry out their roles. Progress has been made on funded initiatives related to legislative and regulatory tools; however, some gaps and challenges remain.

Enabling legislation, regulations, and agreements

PDAs are governed by several pieces of legislation and associated regulations, which provide the authority to implement various actions that directly or indirectly benefit endangered whale species. These include the:

- *Fisheries Act;*
- *Oceans Act;*
- *Species at Risk Act;*
- *Canada National Parks Act;*
- *Saguenay-St. Lawrence Marine Park Act;*
- *Canada National Marine Conservation Areas Act;*
- *Canada Wildlife Act;*
- *Canadian Environmental Protection Act, 1999;* and
- *Canada Shipping Act (CSA), 2001*.

Regulations stemming from these acts, such as the Marine Mammal Regulations (MMR) and the Prohibition of Certain Toxic Substances Regulations, also include important prohibitions and provisions (see Appendix D for more information on the acts).

Several of the acts include provisions for the protection of specific marine areas for the purposes of conservation. These areas include ecologically significant areas, marine protected areas, national marine conservation areas, critical habitat, and marine national wildlife areas. There are also a number of emergency measures within the acts that can be implemented where immediate action is required for the protection of whales (see box).

Emergency measures available for the protection of endangered whales

Fisheries Act: fisheries management orders for promptly addressing threats to the proper management and control of fisheries and the conservation and protection of fish. Orders can prohibit or limit fishing, the use of certain gear, or impose any other requirements.

Oceans Act: establishment of interim marine protected areas on an emergency basis, if a marine resource or habitat is likely to be at risk.

Species at Risk Act: emergency orders to protect species facing imminent threats to their survival or recovery; may identify critical habitat and include prohibitions or required actions to protect the species and its habitat.

Canadian Wildlife Act: allows the Minister to take measures as deemed necessary for the protection of wildlife in danger of extinction.

Canadian Environmental Protection Act, 1999: interim orders for immediate action to protect the environment or human health in cases where a substance is or could be toxic, and it is either not on the List of Toxic Substances, or it is on the list and it is not adequately regulated.

CSA, 2001: interim orders, as a temporary regulatory tool, if immediate action is required to deal with a direct or indirect risk to marine safety or the environment.

In addition, there are international agreements and laws that Canada is subject to, which also include relevant authorities and obligations. These include the Convention on Biological Diversity (1996)[5], the Accord for the Protection of Species at Risk[6], and the United Nations Convention on the Law of the Sea[7].

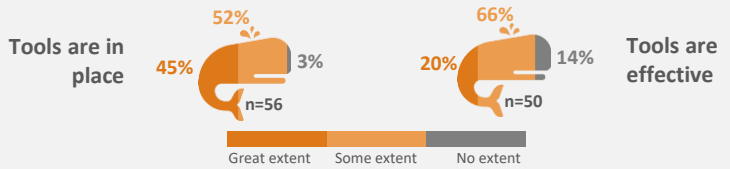
[5] See: https://www.cbd.int/doc/legal/cbd-en.pdf
[6] See: https://www.canada.ca/en/environment-climate-change/services/species-risk-act-accord-funding/protection-federal-provincial-territorial-accord.html
[7] See: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

Legislative and regulatory tools for whale protection and recovery (continued)

Sufficiency of legislation, regulations, and agreements

The acts and regulations provide the necessary legislative framework for the protection and recovery of endangered whale species. The provisions therein address the various identified threats to whales, and interviewees and survey respondents felt that regulatory tools and authorities to support the implementation and enforcement of whale-related measures were in place and overall effective.

Internal survey respondents believed that necessary regulatory tools are in place and are, overall, effective.



Progress has been made with respect to the implementation of funded activities related to legislative and regulatory tools.

- The MMRs were amended in 2018 to apply to conservation and protection of marine mammals, by providing new minimum approach distances, implementing mandatory reporting of interactions, and clarifying the definition of disturbances.
- Amendments to the *CSA, 2001* were completed in 2018, allowing the government to regulate for environmental reasons and giving the Minister of TC the power to make interim orders if immediate action is required to deal with threats to marine safety or the marine environment.
- Proposed amendments to the Prohibition of Certain Toxic Substances Regulations to add or further restrict seven contaminants harmful to whales have been published for comment.

Challenges and gaps

Some legislative and regulatory gaps and challenges were identified.

- There are currently no comprehensive regulations in place to regulate the activities of whale watching vessels, aside from the minimum approach distances and sustainable whale watching agreement and licensing scheme (both concerning SRKW specifically), which are included in SRKW-related annual interim orders made by the Minister of Transport under the *CSA, 2001*. It is challenging to produce sufficient evidence on the violation of approach distances.
- Interim orders under the *CSA, 2001* are considered a very effective mechanism; however, they are a temporary short-term solution with some limitations regarding prevention and sustainability. Other tools, like marine protected areas, take a long time to implement, so there is a gap in the medium-term. Several interviewees expressed that a permanent regulatory process is needed.
- Enforcement relies heavily on automatic identification system (AIS) transponder data to provide information on ship identity, speed, and direction. However, many vessels are not required by regulation to carry AIS transponders (e.g., small vessels less than 13 m of length), thus making enforcement more difficult.
- There are regulations that challenge the ability to implement closures of fishing areas using variation orders (e.g., Aboriginal Communal Fishing Licenses Regulations). Furthermore, some current regulations related to fisheries for other species may impede progress on some measures such as rope-on-demand fishing gear.
- Certain tools and regulations (e.g., interim sanctuary zones) are under TC jurisdiction. PC and DFO personnel can only provide warnings, document non-compliance, and report the violations to TC. This creates challenges and requires significant effort and coordination when it comes to staff enforcing other departments' regulations.[8]
- Compliance with guidelines developed to address contaminants threats is voluntary, unless they become regulations. Implementing a regulation, however, is a multi-step process and typically takes several years. Furthermore, often it is difficult to identify the source of contamination and assign fault for contaminant issues.

[8] For example: on the Pacific Coast, TC is responsible for regulatory oversight of interim orders under the CSA, 2001, but does not have field presence. DFO fishery officers are designated under CSA, 2001 to assist with inspections, but there is no associated funding, training, tools and authority to enforce recommendations being made (e.g., vessel speed restrictions). PC park wardens are designated fishery officers and are designated under CSA, 2001 to assist with inspections, and PC received some funding to support parks warden presence within national park waters. However, park wardens also do not have the authority to enforce recommendations being made under TC legislation. Fishery officers and park wardens can warn and report to TC but TC must issue follow through with the action.

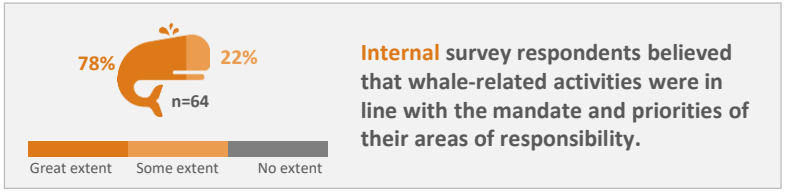
Alignment with mandates, priorities and international practices

Funded activities to support the protection and recovery of the targeted species were well-aligned with the programs, priorities, and mandates of PDAs; and with international guidelines and practices of other jurisdictions.

Alignment with programs, priorities, and mandates

Many of the relevant pieces of legislation governing the PDAs explicitly include responsibilities that directly relate to the whale-related initiatives.

- The *Canada National Parks Act* states that the Minister's first priority in the management of parks must be the maintenance or restoration of ecological integrity. The *Saguenay-St. Lawrence Marine Park Act* provides authority to make regulations for the protection of ecosystems, and any elements of ecosystems, in the park.
- The *Canada National Marine Conservation Areas Act* holds the Minister responsible for marine conservation areas, including long-term ecological vision and ecosystem protection.
- The *Species at Risk Act* exists to prevent wildlife species from being extirpated or becoming extinct; to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and to manage species of special concern to prevent them from becoming endangered or threatened. The *Act* states that the responsibility for the conservation of wildlife in Canada is shared among the governments in this country.
- The *Canadian Environmental Protection Act, 1999* states that the Minister has an obligation to administer the act in a manner that protects the environment.
- The *Fisheries Act* holds the Minister responsible for enforcing pollution prevention provisions, which prohibit the deposit of deleterious substances into water frequented by fish (definition of fish includes whales).
- The *CSA, 2001* states that the Minister has the responsibility to protect the marine environment from damage due to navigation and shipping activities.



Internal survey respondents believed that whale-related activities were in line with the mandate and priorities of their areas of responsibility.

Additionally, the government's priority-setting documents have made it clear that conservation generally, and that of whales specifically, is to be a priority. This is most clearly stated in the Budget 2018 announcement associated with the funding of the Whales Initiative, but the 2021 and 2022 budgets[9] also included relevant funding announcements. Furthermore, recent mandate letters for DFO, TC, and ECCC included directives to reduce emissions in the marine sector, protect marine species and ecosystems, strengthen marine research and science, and conserve marine areas.

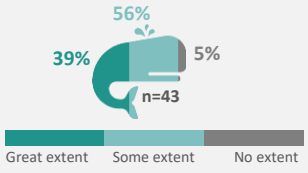
Finally, among the government's key priorities is reconciliation with Indigenous Peoples. The government has increased efforts in this area over the past several years, recognizing its constitutional and treaty obligations and, in 2021, passing into law an Act respecting the United Nations Declaration on the Rights of Indigenous Peoples. Recent departmental mandate letters included direction to build on the progress made with First Nations, Inuit, and Métis people and on reconciliation with Indigenous Peoples. Recognizing the significance of the three targeted whale species to Indigenous Peoples, the whale-related initiatives included funding for building partnerships with, and developing capacity within, Indigenous communities and groups to respond to marine mammals in distress.

[9] 2018: https://www.budget.gc.ca/2018/docs/plan/toc-tdm-en.html; 2021: https://www.budget.gc.ca/2021/report-rapport/toc-tdm-en.html; 2022: https://budget.gc.ca/2022/report-rapport/toc-tdm-en.html.

Alignment with mandates, priorities and international practices (continued)

Alignment with international practices

International bodies (e.g., International Whaling Commission, Food and Agriculture Organization) do not have recognized standards or practices related to the threats addressed by whale-related initiatives. Rather, they have published general guidelines on a variety of whale protection and recovery issues, including: large whale entanglement response, prevention and reduction of marine mammal bycatch, and whale watching.



External survey respondents believed that, overall, funded activities are aligned with international guidelines.

External survey respondents indicated that Canada is a leader in many practices related to whale protection and recovery, including for acoustic monitoring, particularly ship source underwater noise through the Enhancing Cetacean Habitat and Observation (ECHO) program (see page 28). Canada is also contributing to the development of International Maritime Organization guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life, and continues to be a leader in large whale disentanglement and the continued implementation of dynamic fisheries closures to mitigate key threats to whale recovery. A few examples were identified where Canada is aligned with practices in other jurisdictions.

- Canada's actions to monitor and reduce contaminants [e.g., the Pollutants Affecting Whales and their Prey Inventory Tool (PAWPIT), SRKW Action Plan Recovery Measures] are aligned with similar practices and goals in the United States. Of note, the protocol that is currently being developed for the derivation of environmental quality guidelines for the protection of apex marine mammals is the first internationally.
- Canada has a partnership with the United States under Be Whale Wise[10] for aligned measures and communications actions on the Pacific coast. Both countries operate a regional response network composed of government, conservation organization, and Indigenous partners that ensure experts support safe and effective responses.
- Canada's methods to protect NARW, including mandatory speed reductions, fisheries closures, and whalesafe fishing gear, are aligned with similar practices in the United States.

However, external stakeholders noted other international practices could help inform future whale-related programming in Canada.

- **Whale watching** licensing and regulations for SRKW in Washington State and the voluntary whale watching recognition program WhaleSENSE.
- **Prey availability** management measures in the United States, including hatchery fish mass marking, increased hatchery production, and removal of pinnipeds (i.e., a carnivorous aquatic mammal such as a seal or walrus).
- Development of **anthropogenic noise** (i.e., created by human activity) thresholds by the European Marine Strategy Framework Directive.

Other notable practices in other jurisdictions

- The National Oceanic and Atmospheric Administration (NOAA) has created a "gear library", where it houses dozens of on-demand systems from different manufacturers. Fishers and researchers can borrow gear to test it, and in return, provide insights on how the gear works, problems encountered, and suggestions for improvement.
- To address ship strikes, the United States uses a number of practices, including Blue Whales Blue Skies voluntary speed reduction and Whale Alert.[11]

[10] For more information on Be Whale Wise, see: https://www.bewhalewise.org.
[11] The Blue Whale Blue Skies voluntary speed reduction operates along the coast of California – see: https://www.bluewhalesblueskies.org/. For more information on Whale Alert, see: https://whale-alert.io.

Governance for whale-related initiatives

Some aspects related to the governance of whale-related activities were seen as successful, although some opportunities for improvement were identified.

Interdepartmental governance for whale-related initiatives

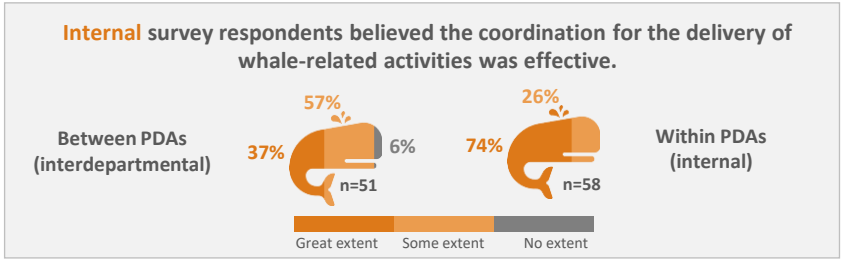
While governance was not a key focus, the evaluation examined interdepartmental governance[12] using a forward-looking approach to identify lessons learned for the future.

The implementation of whale-related activities is guided by the Interdepartmental Assistant Deputy Minister (ADM) Whales Committee, which includes ADMs from all four PDAs, as well as representation from other relevant departments, as necessary. The committee's role includes maintaining oversight, providing strategic direction, and facilitating coordination amongst departments and alignment with other federal priorities, such as reconciliation with Indigenous Peoples and energy development. It reports to and takes guidance from the OPP Deputy Ministers' Committee to ensure whole-of-government coordination and alignment with government priorities at the most senior level. The activities are also supported by several technical working groups on a variety of subjects, as well as other collaborative fora related to work on whale conservation.

Determining the interdepartmental governance structures for whale-related initiatives was challenging, as numerous committees and working groups were mentioned in interviews and referenced in documents. However, the structure is not clearly outlined in program documentation. In addition:

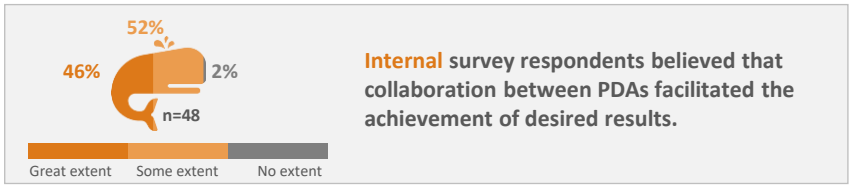
- some committees have terms of reference and meet regularly; others do not have terms of reference and it was not always clear whether the committee was meeting regularly;
- some committees are national in scope; others are region-specific; and
- some committees are species-specific, topic-specific, threat-specific, or departmental-specific.

Despite the complexity and challenges related to the governance, overall, coordination for whale-related activities appeared to be effective. Internal survey respondents were positive about the coordination of the delivery of these activities, particularly within their own PDA.



Internal survey respondents identified some complexity and aspects of interdepartmental governance that could be streamlined, such as clarifying leadership, roles and responsibilities and documentation for some activities. The fact that funding envelopes for whale-related activities were in addition to pre-existing funding might have contributed to challenges with interdepartmental governance, planning, and integration.

Internal survey respondents believed that collaborative opportunities within PDAs facilitated success. In addition, the technical working groups appear to have worked well, particularly those related to SRKW.



Appendix C provides specific information on coordination and collaboration related to the four activities examined in-depth.

[12] The internal governance within each PDA was not identified as an area of concern for the evaluation during the planning phase.

Implementation of activities

PDAs have undertaken a significant number of activities to support the protection and recovery of the targeted whale species, many of which were implemented as planned (i.e., within timelines and within dedicated resources). Measures and activities were planned using an adaptive strategy, which allowed for adjustments to activities based on sound advice, science, and Indigenous and stakeholder input.

Activities carried out under whale-related initiatives

The four PDAs have implemented a number of activities, which have been grouped into four categories for the purposes of the evaluation.

Research and monitoring

Objective: Monitor the threats and the presence, movements, and activities of the targeted whale species to provide information to support management decisions, regulatory controls and guidelines; develop technology to support these activities.

Activities

- Conducted aerial surveys to detect whales.
- Installed underwater listening stations, gliders, hydrophones and Viking buoys.
- Monitored and researched various threats to the SLEB, SRKW and NARW (e.g., contaminants of concerns, prey availability, acoustic disturbance, effects of development and other potential and actual causes of mortality).
- Investigated innovative solutions for fishing gear, whale detection and monitoring and underwater noise reduction.

Management/mitigation measures

Objective: Implement targeted management measures to mitigate impacts and prevent threats to whales and their food sources.

Activities

- Implemented measures, such as: area-based fisheries closures, slowdown zones, interim sanctuary zones, vessel approach distances, voluntary fishing avoidance zones, and gear marking requirements.
- Explored feasibility of using new fishing technologies (e.g., ropeless gear, weak points) and implemented mandatory reporting for lost gear and interactions between vessels or fishing gear and marine mammals.
- Conducted marine mammal response activities (e.g., disentanglement).

External partnerships, outreach, and education

Objective: Establish partnerships to facilitate the development and implementation of whale protection and recovery measures and carry out outreach and education to raise awareness and promote behaviour changes.

Activities

- Worked with Indigenous communities and groups.
- Built partnerships with a range of different groups including: other government departments, other levels of government, and the private sector.
- Coordinated and partnered with research institutes, non-governmental organizations, and International organizations
- Conducted public awareness and education activities to promote the importance of recovery measures.

Compliance and enforcement

Objective: Carry out compliance and enforcement to ensure management measures are being respected.

Activities

- Verified compliance with management measures and conducted enforcement activities.
- Conducted patrols and surveillance (i.e., aerial, on water)
- Issued warnings/notifications/penalties in cases of non-compliance; prosecuted cases, as needed.
- Conducted intelligence assessments to support and enhance enforcement activities.

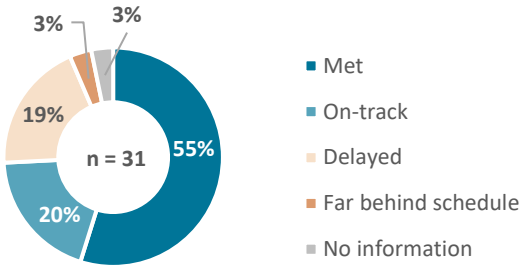
Implementation of activities (continued)

Implementation status

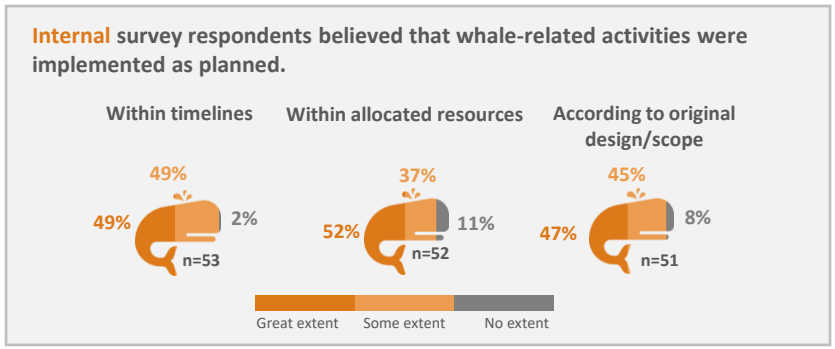
Program dashboard data on key implementation milestones for the whales and SRKW initiatives[13] showed that funded activities were largely implemented within timelines and within dedicated resources (Figure 2). Out of 31 milestones:

- 75% (n=23) of all milestones were either completed or are on track for completion.
- 22% (n=7) of the milestones were delayed, with many of the delays attributable to the COVID-19 pandemic.

Figure 2: Percentage of key implementation milestones that were met, on-track, or delayed[14]



Of the milestones that were delayed, the most notable was the purchase and refurbishment of an airplane for whale monitoring, which was planned for 2020 but was delayed to March 2023 largely due to contracting difficulties and supply chain issues. Underwater noise management plans were also delayed due to the need for additional tests to determine the most appropriate metrics for noise reduction targets to inform further the development of the plans. In addition, the initial timelines for co-development activities with Indigenous communities and groups were also found to have been unrealistically short, in addition to being impacted by the pandemic.



Variations from initial plans

When the whale-related initiatives were launched, it was not known exactly what activities and measures would be needed. Thus, significant flexibility was built into the funding to allow for adjustments based on sound advice, solid science, surveillance, and feedback from stakeholders and partners. Nevertheless, the evaluation did not find significant variations from planned activities and timelines.

- Many activities were implemented earlier than planned (e.g., slow-down areas and related engagement for NARW, contracts to support partners of the marine mammal response program, creation of technical working groups for SRKW).
- There was more significant progress regarding knowledge generation for NARW. Initially, there was less initial science data available for that species and thus the need to generate data was greater. In comparison, SRKW and SLEB had previous activities funded through other sources.
- Implementation of some management measures occurred dynamically as well, in response to active monitoring through aerial surveillance, hydrophones/gliders, AIS data on ship movements, and other sources.

[13] The whale-related OPP and TMX outputs were not included in this analysis. However, based on the analysis of performance data, most of the expected results were achieved as planned, except the finalization of the science products related to the effectiveness of noise mitigation measures, because more modelling and analysis is required and is planned to continue in 2023.
[14] This analysis is based on informed assumptions due to lack of clarity on the formal state of completion in the available data.

Challenges related to implementation

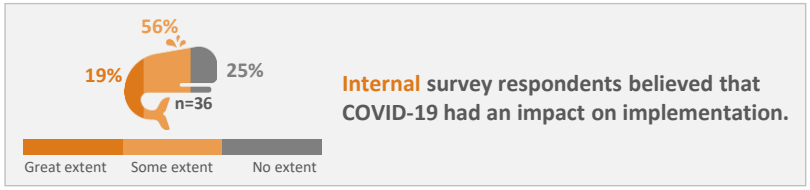
PDAs faced some challenges during implementation, particularly with respect to COVID-19 and capacity, which affected the implementation of some planned activities.

Challenges related to implementation of activities

PDAs faced some challenges that affected their ability to carry out certain activities. In some cases they were able to adapt to and mitigate these challenges, but others were outside of their control and had an impact on the completion of some activities.

COVID-19-related impacts

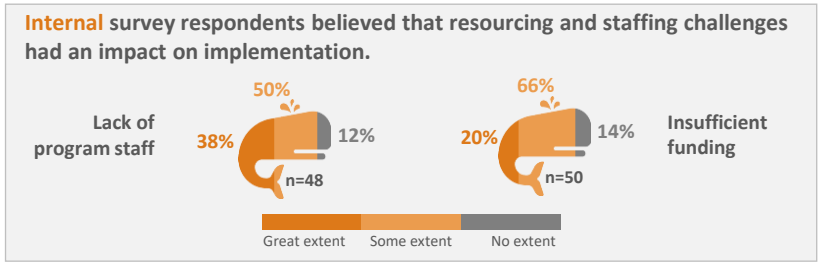
- Some of the PDA's planned fieldwork/data collection was delayed due to the inability to travel; and the use of labs to support COVID-19 testing limited lab space for whale-related analysis.
- Some of the new real-time NARW detection technologies could not be tested as planned. To mitigate this, equipment was tested in areas with no NARW, using manufactured sounds as a proxy for whale calls, which was not as ideal.
- The in-person interpretation in national parks was limited, which impacted the delivery of SRKW educational programs, including the gathering for engagement and learning. Furthermore, extended timelines were required to incorporate First Nations content in interpretive signs.
- The pandemic impacted the staffing of the refurbishment workshop, thus further delaying the refurbishment of some equipment, such as the TC Dash 8 aircraft.



See Appendix C for specific challenges and factors that had an impact on the four activities examined in-depth.

Capacity-related impacts

The significant investments for endangered whales provided additional capacity to PDAs to implement activities related to the protection and recovery of whales. However, there was evidence that resourcing and staffing challenges remained.



There were numerous impacts related to these challenges.

- Many program areas (e.g., fisheries management, enforcement, outreach and education, communications, policy, science) had to use funding from other program areas (e.g., OPP) and/or risk manage funding.
- Where additional funding could not be redirected to whale-related activities, work was kept to a minimum or limited to the highest priorities.
- Building internal expertise was a challenge, which was partially addressed by the expertise of the technical working groups.
- Resources were not allocated for administration and secretarial functions, thus, causing coordination and reporting challenges. This also had an impact on other activities (e.g., subject matter experts were taken away from their work to fulfill this role).

Limitations with CCG vessel availability also led to delays and postponements for some planned DFO fieldwork for NARW and reduced the scope of work for shipping noise impact assessments.

Indigenous involvement in whale-related programming

The three targeted whale species are significant to Indigenous Peoples' cultures, communities, and the ecosystems on which they rely. PDAs put processes in place to engage Indigenous communities and groups in whale-related programming; however, their degree of involvement in these processes varied. Several areas for improvement to the engagement and consultation processes were identified by Indigenous communities and groups.

Significance of whales to Indigenous Peoples

First Nations on the Pacific coast and representatives of Indigenous groups from the Atlantic coast explained the significance of the whales to their cultures, communities, and the overall marine ecosystem.

On the Pacific coast, some First Nations explained the spiritual connections they have with the SRKW and said that they regard them as relatives. Others shared that the whales feature prominently in their songs, oral traditions, art, and ceremonies. Representatives spoke with great concern for the health and recovery of the SRKW and agreed the species' protection was a priority given the integral role it plays in their cultural identity and the health of the ecosystem.

Representatives from Quebec and Atlantic Canada prefaced their perspectives with the fact that they were not Indigenous themselves, rather working for Indigenous groups. Nevertheless, they spoke of the targeted whale species being a barometer of health for the entire ecosystem and were concerned about their long-term survival.

Those located along the St. Lawrence Estuary spoke of the importance of the beluga harvest to the diet and trade of the First Peoples of the region, while being loved and revered by present-day communities. Representatives in Atlantic Canada shared that the NARW held cultural importance to the Indigenous communities and groups in the region, playing key roles in their legends.

> "Historically they are known as Blackfish. They are the health of the waters made manifest. They are powerful beings whose spirits count for more than any development, any amount of imaginary wealth, any illusion of power and dominion over nature... Of all marine species they have some of the closest ties to [us]."

> "The People and the North Atlantic right whale have a strong connection. North Atlantic right whales were seen as masters of life in the sea, and they are a part of First Nation legends and stories. The People won't put a hierarchy on living creatures, but NARW do have a cultural significance to the People in the area."

> "The beluga is a strong species…[and] it is a species of importance for the community. People love to observe marine mammals and the beluga is particularly important."

Indigenous involvement in whale-related programming (continued)

Expectations for engagement and consultation

At the outset of whale-related initiatives, Indigenous communities and groups recommended that the government clearly define the engagement and consultation processes and allow for substantial opportunity for two-way dialogue and broad representation of perspectives.

Indigenous communities and groups also requested timely and transparent sharing of information to support joint decision-making and to ensure measures put in place were justifiable. In addition, they wanted to be engaged early in the process to ensure time for their input to be integrated into final decision-making. Finally, they requested their participation be supported by dedicated and non-competitive funding to ensure ongoing and meaningful involvement in whale protection and recovery efforts.

Engagement approaches

The government's engagement and consultation processes with Indigenous communities and groups varied by region. On the Pacific coast, all 37 First Nations who had the potential to be impacted by the SRKW annual interim measures were approached to discuss the development and implementation of annual measures (see Appendix B for the full case study on Indigenous involvement in the SRKW Initiative).

Methods of engagement and consultation with the Nations varied by year with evidence suggesting improvements were made based on feedback. For example, in the Pacific region, a multi-Nation Tier I and II process (see box) was established in response to feedback from Nations and to complement the official consultation process. The extent of engagement in the processes depended on several factors specific to each Nation, such as:

- the spiritual and cultural significance of the SRKW to their people;
- the extent to which their marine territory overlapped with the geographical scope of the management measures;
- their community priorities; and
- their capacity to participate in engagement activities.

Engagement and consultation in Quebec and Atlantic Canada was more limited and ad hoc than the approach used in the Pacific region. Some examples of engagement activities were provided (e.g., participation in discussions on NARW-related measures and activities, involvement in the development and dissemination of educational materials).

It was noted by representatives on the Atlantic Coast that Indigenous communities and groups seemed to initiate engagement rather than being invited to existing tables by PDAs (e.g., requesting seats on working groups). Representatives also indicated an ongoing need for Indigenous fishers to be included in discussions on ghost gear and entanglement prevention.

PDAs did note that engagement on whales did not initially seem to be of significant interest, as when they did attempt to consult Indigenous communities and groups in Quebec and Atlantic Canada, their efforts were not always successful. For example, when zones became restricted to all vessels, TC attempted to engage and discuss with Indigenous fishers, however none responded. PDAs did note that more recently there seems to be a growing interest.

SRKW Tier I and II multi-Nation process

In late 2020, a Tier I and II multi-Nation process was developed, with the first meeting taking place in spring 2021. The meetings were facilitated by an Indigenous consultant and were guided by a co-developed framework for cooperation and collaboration for SRKW management measures. The Tier I meetings were reserved for First Nations only, while representatives from the PDAs joined the Tier II table. The purpose of the process was to support nation-to-nation and Government of Canada-to-nation dialogue to inform the development and implementation of the SRKW management measures prior to engagement with stakeholders. The process also supported information sharing and facilitated connection to other Government of Canada processes relevant to SRKW recovery.

Indigenous involvement in whale-related programming (continued)

Satisfaction with engagement and consultation processes and opportunities for improvement

The level of satisfaction with the engagement and consultation processes varied by Indigenous community and group, with evidence suggesting that PDAs attempted to respond to feedback and concerns raised by First Nations on the Pacific coast.

Each year, Indigenous communities and groups called on the PDAs to effectively consult and meaningfully involve them in whale-related programming. As indicated on the previous page, the multi-Nation Tier I and II process was established in the Pacific region to enhance engagement and complement the official consultation process. While the Tier I table was deemed of value to some First Nations as a forum for frank and effective discussion between Nations, participation in the Tier II table varied by season and decreased year over year. Reasons noted for this low attendance included:

- inadequate notice of meetings and insufficient time for in-depth and meaningful discussion;
- a lack of transparency on how previous input had been included in decision-making;
- a lack of financial support for Nations to participate in the process; and
- the fact that the multi-Nation process did not meet the Government's duty to consult. As a result, some prioritized bilateral discussions over other engagement opportunities.

Furthermore, several First Nations disagreed with the consultation approach adopted by the PDAs and many Nations felt engagement processes prioritized views of industry and occurred too late in the annual review process, only after key decisions had been made. First Nations called on the PDAs to address these concerns to establish a more cooperative approach, improve attendance, and ensure more broad representation at meetings.

On the Atlantic coast, some representatives noted satisfaction with the approach to engagement (e.g., invitations to participate were timely; opportunities to meet as Indigenous communities and groups separate from others, were appreciated). However, there was a desire to have more frequent opportunities to meet with other partners to discuss whales programming. The evaluation team noted evidence of very few forums involving Indigenous communities and groups in discussions around NARW and SLEB protection and recovery. Some representatives interviewed offered suggestions to improve the engagement sessions, including moving away from highly technical briefings to explore more appealing and digestible ways to engage Indigenous communities and groups and facilitate rich and fruitful discussions.

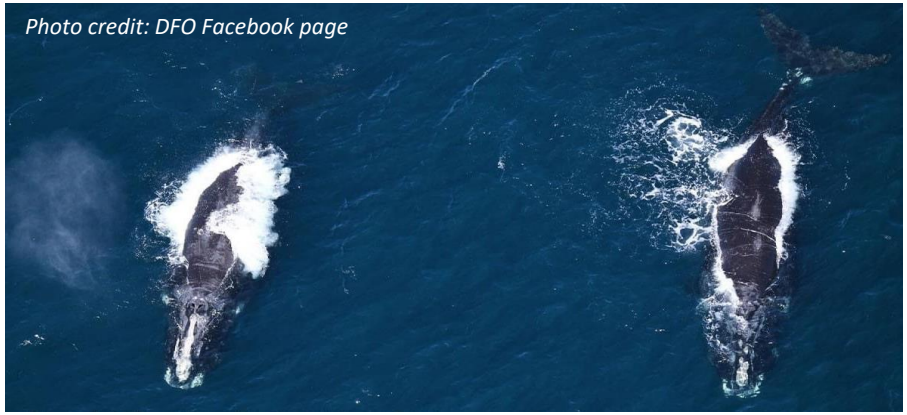


Photo credit: DFO Facebook page

Evaluation findings

Progress addressing threats

Key findings:

- The knowledge base to support decision-making related to whale protection and recovery has increased significantly as a result of new data collection, monitoring, Indigenous Knowledge and Science, and scientific research activities.
- There is room for improvement in terms of the accessibility, integration, and sharing of data to facilitate its use. The research and monitoring work undertaken over the past five years does not address all existing and emerging information needs. Data and information gaps will always remain, and the process of addressing them is ongoing.
- While it is early to assess the full effectiveness of some measures, the activities funded to support whale protection and recovery were viewed as appropriate to achieve results.
- Progress has been made on mitigating risks to whales. There has been more significant progress in reducing entanglements and vessel strikes compared to progress addressing other threats (e.g., prey availability, acoustic disturbance, and contaminants), which typically require more time. However, there is more work to be done in areas such as compliance and enforcement, scope of activities, partnerships and engagement, and threat mitigation performance measurement.
- Indigenous communities and groups shared recommendations and priorities for whale protection and recovery, including working in partnership. Alignment between Indigenous priorities and objectives varied by threat, species, and region; and their views on the effectiveness of recovery efforts were mixed.

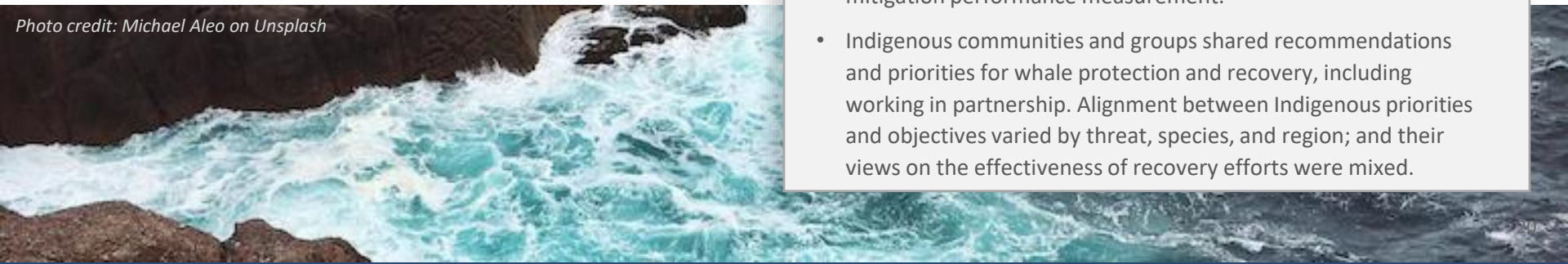


Photo credit: Michael Aleo on Unsplash

Measuring progress in addressing threats

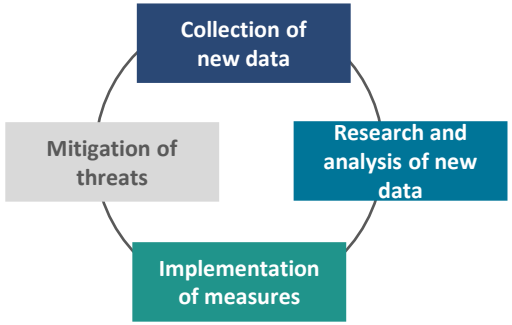
How progress was measured

The evaluation aimed to assess the extent to which progress was made in addressing threats to the targeted species. Many whale-related activities funded since 2018 largely focused on:

- monitoring and data collection to establish baseline information on the current characteristics of the whales' habitats or level of impact threats are having;
- scientific activities to increase the knowledge base on whale-related risks and on potential interventions to address those risks; and
- testing hypotheses and new technologies to support decision-making.

Multiple cycles of data collection, analysis, and testing are required before sound scientific advice will be available for decision-making on measures. Consequently, while these activities did not directly reduce the impacts of threats, they were undertaken to gather the information and data needed to inform and support the implementation of management measures, which are intended to mitigate the threats to whales.

Figure 3: Results cycle for whale-related activities



Given this, the evaluation focused on understanding the extent to which new information was available for decision-making, the subsequent implementation of measures, and whether measures were contributing to the mitigation of threats.

Limitations with measurement

There are a number of challenges and limitations to determining the extent to which progress was made toward protection and recovery of the whales, including:

- lack of baseline data against which to measure progress (in fact, many funded activities were intended to establish these baselines);
- challenges in defining performance measures that would accurately assess threat mitigation, as well as considerable progress (e.g., there are no established thresholds of the severity of threats, long-term health and life outcomes for whales cannot be measured by population size as there are many other factors affecting the population); and
- it could take many years to gather enough data to determine and observe progress.

Other factors to consider when assessing progress in addressing threats

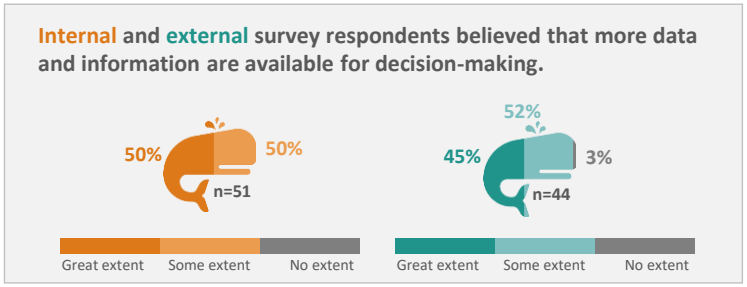
- Evolving environmental factors (such as climate and ocean conditions) could influence whale habitat and behaviour in a way that is hard to predict accurately when measures are implemented and this could affect expected effectiveness.
- The long-term nature of most interventions and the long life cycle of target species in terms of recovery.
- Disturbances and other threats that originate from outside Canadian waters.
- Threats that cannot be fully eliminated but only reduced to a tolerable level (e.g., pollution, vessels noise).
- Socio-economic and cultural contexts (i.e., measures should not be assessed in isolation from their impacts to the Canadian economy or to the coastal communities).

Availability of new data and information

The knowledge base to support decision-making related to whale protection and recovery has increased significantly as a result of new data collection, monitoring, Indigenous Knowledge and Science, and scientific research activities.

Collection of new data

Overall, there is strong evidence that new data and information is available to support decision-making as a result of the investments, which has resulted in an increase in the knowledge base related to whale protection and recovery.



Specifically, there is now more information available on whale detection. Funding was provided for whale-specific aerial surveillance, which is conducted by several different partners, including: DFO Science, DFO Conservation and Protection (C&P) Fisheries Aerial Surveillance and Enforcement (FASE) program, TC's National Aerial Surveillance Program (NASP), and TC's Remote Piloted Aircraft Systems (RPAS). Together, between 2018-19 and 2021-22 partners reported 10,682 hours of whale-specific[15] aerial surveillance.

10,682

Hours of aerial surveillance conducted specifically for whale detection.

DFO Science	DFO C&P FASE	TC NASP	TC RPAS
5,446	3,557	1,509	170

Acoustic monitoring also increased the availability of information, including on whale detection and noise levels from vessels. Acoustic monitoring has been done through the deployment of acoustic monitoring stations, gliders, and Viking buoys.

4	Acoustic monitoring stations, including an underwater listening station in Boundary Pass.
4	Glider deployment missions (in three general locations for a total of 376 days in 2019, 2020 and 2021).
7	Viking buoys.

In addition to the detection and noise data, other new information available includes: whale behavioral data, vessel transit data, contaminant-sampling data, toxicological reports, photogrammetry datasets, and data tracking and visualization tools.

On the Pacific coast, near-real time monitoring and whale detection verification capacity was not funded under the Whales or SRKW Initiatives, so other programs were leveraged and funding risk-managed to meet these needs.


Photo credit: TC Facebook page

[15] Prior to the investments, whales were detected as part of regular surveillance (e.g., enforcement activities), but it was not done systematically. The whale-related initiatives provided funding to support surveillance specifically for whale detection. The reported whale-specific hours illustrate the utilization of this funding; however, they may not accurately reflect the entire whale detection aerial surveillance efforts since all flights still do it—either as a main or a secondary task (see Appendix C on whale-related aerial surveillance for more context).

Availability of new data and information (continued)

Research and analysis of new data

Review of performance data showed that most targets for science products have been met or exceeded, with the exception of a few that were on track but required more time to be completed.

Between 2018-19 and 2021-22, a number of new Canadian Science Advisory Secretariat (CSAS)[16] advisory reports and scientific publications on whales were made available.

14	CSAS products and advisory reports.
9	Peer-reviewed publications on stressors and impacts of shipping on marine life and their habitat.
41	Peer-reviewed publications on SRKW, NARW, and SLEB.
12	Monitoring data reports on contaminants of concern in whale habitats.

These reports focused on several areas, including:

- developing scientific advice on marine ecosystems applicable to SRKW, NARW, SLEB, and their prey;
- testing new technologies for acoustic or aerial monitoring and detection, such as static hydrophones, near real-time systems, gliders and the RPAS;
- assessing the effects of vessel noise reduction technologies and vessel noise/vessel strike mitigation; and
- monitoring the presence and assessing effects of contaminants in whales' habitats.

Input from surveys and interviews confirmed that, as a result of research and monitoring activities, in general, the Government of Canada is in a better position to take protective actions, based on knowledge and scientific evidence. CSAS advisory reports and studies were specifically acknowledged as being instrumental for decision-making; however, some studies required more time and are still in progress.

Examples of scientific areas with significant knowledge increase

- Better understanding (in terms of precision and accuracy) of the SRKW habitat (e.g., identification of important transit and foraging zones, migration patterns) and forage fish habitats and prey availability for SRKW.
- Information on NARW distribution and ability to model NARW distribution in critical areas along vessel routes, as a result of aerial surveys, acoustic monitoring, and analysis of AIS data.
- Modelling the effects of management measures for noise reduction and further research on new noise reduction technologies.
- Geospatial inventories of contaminated sites in areas of interest; and of potential sources of pollutants and estimated releases in areas of interest.

For examples of Indigenous Knowledge being woven into the whale-related programming, see page 46.

[16] The CSAS coordinates the scientific peer review and science advice for DFO. The CSAS publishes departmental scientific advice and information on issues such as fish stock dynamics, species at risk, invasive species, ecology of marine and freshwater ecosystems, marine protected areas, aquaculture and the use of living aquatic resources.

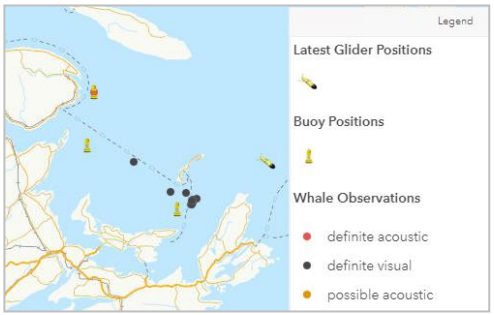
Accessibility of data and information

While there has been a significant increase in the availability of information for decision-making, there is room for improvement in terms of the accessibility, integration, and sharing of data to facilitate its use. In addition, the research and monitoring work undertaken over the past five years does not address all existing and emerging information needs. Data and information gaps will always remain, and the process of addressing them is ongoing.

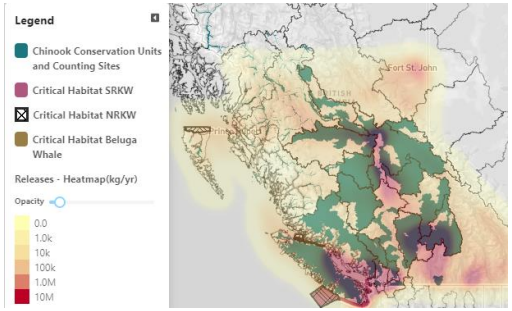
Accessibility of data and information

Much of the information and science products that are now available as a result of whale-related monitoring and research activities are accessible on the websites of the PDAs.

- CSAS advisory reports are posted on CSAS's publications site.[17]
- Other scientific studies and reports are published in peer-reviewed journals.
- Known locations of whales (mostly on the Atlantic coast) are displayed on two interactive mapping tools: Whale Map[18] developed in 2018; and DFO's Whale Insight[19], launched in May 2022. Acoustic and visual detections from whale-related monitoring and surveillance activities, as well as from other trusted sources (such as NOAA) are the sources for these maps.
- ECCC has developed the online PAWPIT tool[20] as an interactive inventory and map of pollutants and their sources in the habitat of endangered whales and their prey. It covers only the SRKW habitat areas and a version for SLEB is in development.



A screenshot from Whale Insight, depicting an example of the locations of whales' sightings (in dark) acoustic detections (in red) and of the acoustic monitoring platforms (in yellow)



A screenshot from PAWPIT, showing data on pollutants in SRKW habitat and distribution areas of its primary prey, Chinook salmon.

Challenges related to data and information accessibility

While these tools were described as useful, many interviewees and survey respondents expressed concerns that finding, extracting, and using specific data for their work was challenging (e.g., different types of data were disseminated in different formats, and through different platforms and web applications).

Some other limitations with regards to availability of data and information were identified, such as the time needed for official peer-reviewed publication of scientific reports and related data before they become available, which delays their use. There was also perception of missed potential opportunities to increase the use of data and information produced by non-federal scientists, which could speed up the implementation of some measures.

Accessibility refers to the ease with which users are able to identify, obtain and use data and information, which correspond to their needs.[21]

[17] CSAS portal: https://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/result-eng.asp?params=0&series=7&year=2021
[18] Whale Map: https://whalemap.org/.
[19] Visual and acoustic detections are typically reported within the same day, and the map is updated every 15 minutes: https://gisp.dfo-mpo.gc.ca/apps/WhaleInsight/eng/?locale=en .
[20] See: https://pawpit-oipabp.ca/.
[21] Source: https://www150.statcan.gc.ca/n1/pub/12-586-x/2017001/article/s5-eng.htm

Remaining data and information gaps

Remaining data and information gaps

Despite the success of the research and monitoring work and increased data and information, there will always be some existing and emerging data and information needs, because current knowledge has to be continuously updated to reflect newer scientific studies and information, as well as the evolving factors of environment. Almost all experts who responded to the external survey agreed that critical data and information gaps remain. Looking forward, the evaluation identified broader areas for additional data and research, as well as whale-specific data gaps (these are summarized below).

External survey respondents said that there are critical remaining data or information gaps specific to the three targeted species.

Broader areas for additional data and research

Continuous update and improvement of the knowledge base for decisions on management measures

- For proper coverage and detection across two oceans, more monitoring and surveillance locations are needed; in addition to covering the same locations over time.
- Interdependencies between different threats and the cumulative effects of interventions to one or several threats need to be better studied and understood.

Assessing effectiveness of measures

- Data and analysis on enforcement and non-compliance, and ongoing monitoring and assessment of how the measures work, to inform their fine-tuning and improvement.
- The actual recovery feasibility (e.g., likelihood of recovery) is an important gap which affects priority setting and the assessment of measures' feasibility.
- Data and information on whale presence and threats exposure outside Canadian-monitored waters is another important gap that affects implementation of measures that are most appropriate.

Changing factors of whale habitats

- Ongoing changing environmental conditions require continuous data gathering, monitoring and research to support the adaptation of management measures to the changes in the threats and risks to whale habitats (e.g., the effects of a warming, a more acidic ocean).
- There are new emerging needs with regards to studying contaminants for whale protection (e.g., geographic areas of contaminants in whale habitats not studied before).

Whale-specific data gaps

SRKW

- Foraging studies and enhanced understanding of prey availability in finer scale resolution in space and time are needed in more geographic areas.
- Advancing real-time monitoring and studies of effects of physical disturbance, acoustic noise and vessel noise thresholds are needed.
- Need for more monitoring of contaminants in SRKW prey habitats, including those discharged through landfill leachate and wastewater treatment systems.
- Increasing the value of data and information by weaving Indigenous Knowledge and western science (e.g., on salmon and vessel traffic locations).

NARW

- Better understanding of threats related to NARW prey availability.
- Integrating cryptic mortality (i.e., the unrecovered whale carcasses) in the threat analysis for NARW, to improve accuracy of assessments on the severity of risks.

SLEB

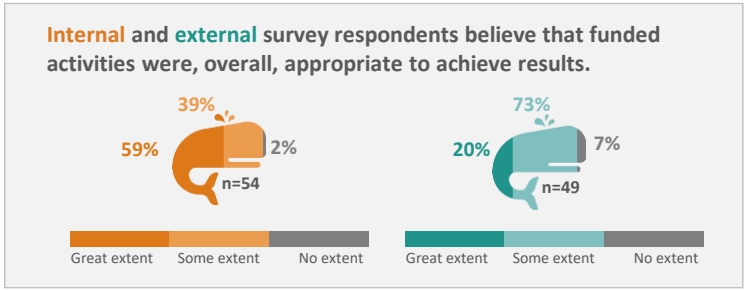
- Data and information on SLEB seem to be the least available. Research done to date has increased data available on diet and seasonal changes in distribution before and after summer; however, it is only the first step in identifying critical SLEB habitats.
- More field work and modelling efforts are needed to determine measures that are appropriate and effective for SLEB.
- There is a need for more pollution monitoring in the Saguenay River and freshwater monitoring for contaminants to SLEB, including those being discharged through landfill leachate and wastewater treatment systems.

Appropriateness of funded activities

While it is early to assess the full effectiveness of some measures, the activities funded to support whale protection and recovery were viewed as appropriate to achieve results.

Appropriateness of activities to achieve results

Overall, the evaluation found that funded activities were viewed as appropriate to achieve desired results related to whale protection and recovery. External survey respondents believed it to a slightly lesser extent than internal survey respondents.



Stakeholders noted that assessing effectiveness is challenging because more research and more time is needed to fully understand how well measures are working. In addition, there are challenges in measuring recovery of the whale populations.

Furthermore, both internal and external stakeholders were in agreement that enforcement is an appropriate and important activity, however, they also noted that the ability to conduct adequate enforcement to support the measures was hampered by both capacity issues and enforceability challenges in the measures themselves.

In terms of additional activities or measures that could be implemented to support whale protection and recovery, it was noted by a few stakeholders, mainly external, that regulations are needed with respect to whale watching.

Some external stakeholders expressed concerns with regards to some of the funded activities/measures not being the optimal way to address whale protection and recovery. These are summarized below.

- **Voluntary slowdown measures**, in general, are less effective than mandatory measures; there is insufficient scientific evidence on the optimal slowdown speeds (see Appendix C on voluntary slowdown measures for more detail).
- **Fisheries closures** are not viewed as effective if triggered after whales are detected, they have limited effectiveness on populations that are very mobile such as the SRKW, and have not been effective in increasing prey availability. Some fisheries closure dynamic areas were also questioned by some industry members as being outdated, inaccurate, or poorly delineated.
- **Interim sanctuary zones** have limited effect because they have not covered essential foraging zones. Additionally, implementing new ones is challenging in terms of social acceptance.
- **Whale approach distances** currently in place are based on scientific evidence that is viewed as inconclusive.

A few stakeholders also suggested that, while some of the activities were appropriate, their scope was too limited. It was suggested that some activities (e.g., noise monitoring and whale detection), should be expanded (e.g., additional geographic areas, more species).

The following sections provide additional detail on the evaluation findings related to the observed changes and progress on addressing threats. Appendix C includes specific detail on progress made by the four activities examined in-depth.

Evidence of progress made

Progress has been made on mitigating risks to whales. There has been more significant progress in reducing entanglements and vessel strikes compared to progress addressing other threats (e.g., prey availability, acoustic disturbance, and contaminants), which typically require more time. However, there is more work to be done in areas such as compliance and enforcement, scope of activities, partnerships and engagement, and threat mitigation performance measurement.

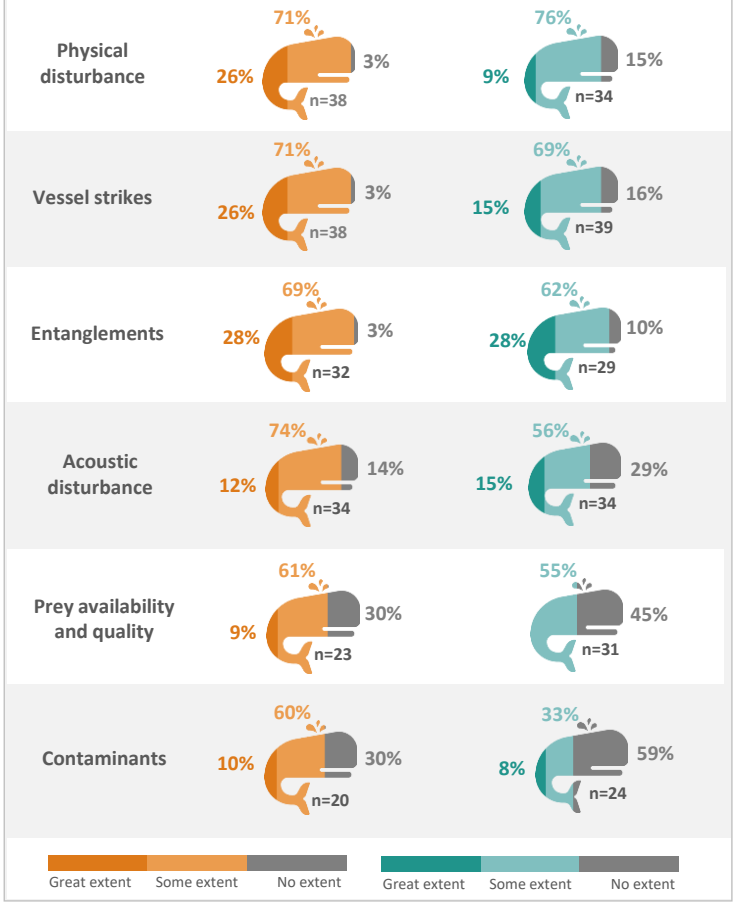
Evidence of progress made

Various documents and data reviewed, and survey responses, provided evidence of some progress made on mitigating risks to whales as a result of measures, although opinions varied by threat. Overall, internal respondents had more positive views than external respondents (See graphic to the right).

Physical disturbance, vessel strikes, and entanglements were viewed as the threats that have been addressed to the greatest extent and some examples were provided (see Appendix C for more examples and data).

- Increased outreach and education regarding vessel management measures (e.g., approach distance limits, seasonal slowdowns, interim sanctuary zones) helped reduce vessel strikes and physical disturbance for both SRKW and NARW.
- Fisheries management measures (e.g., opening the fishing season earlier, closures protocols when NARW in area, whalesafe fishing gear, gear marking, lost gear reporting requirements) contributed to entanglement prevention.
- The whale-related capacity within the marine mammal response program has increased, both in the regions and nationally. As a result, progress was made to improve incident response protocols and procedures and to increase training.

Internal and external survey respondents believed that progress has been made to mitigate the threats to whales, to varying extents.



Evidence of progress made (continued)

Prey availability, acoustic disturbance, and **contaminants** were viewed as threats that are more challenging to address and require more time to see results. Examples of areas where some progress was made were provided.

- Understanding of the types and presence of pollutants affecting whales and their prey has increased; but implementation of mitigation measures is slow and not enough time has passed to see long-term results.
- Implementing voluntary vessel slowdown measures as part of the ECHO program (see box) has been promising[22]. On the Pacific coast, the measures were successful over the past three years (with >80% compliance). They were effective in shared U.S./Canada waters, where Canada has no authority for mandatory measures, because the voluntary regime could cover greater area. However, their efficacy is dependent on voluntary compliance (which is impacted by economic factors), and no enforcement measures can be taken in case of non-compliance because no statutory requirements to comply exist.
- In 2021, the SRKW Accountability Framework[23] was developed to assess how the management measures were contributing to SRKW recovery over time.

Example from the ECHO program

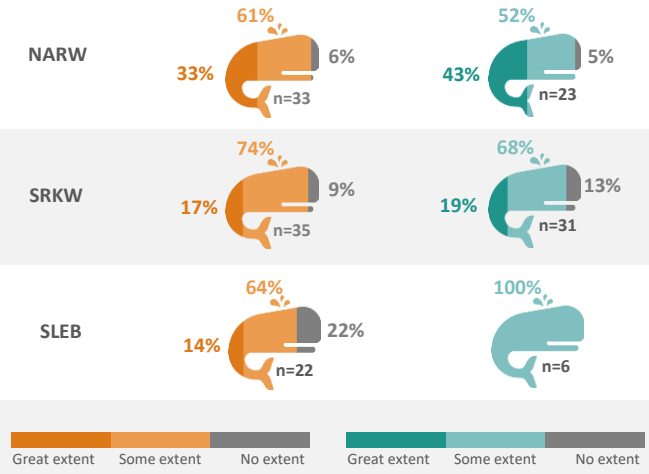
The ECHO Program[24] is a collaborative regional initiative led by the Vancouver Fraser Port Authority. It was launched in 2014 and is guided by the input and advice of government agencies, the marine transportation industry, Indigenous advisors, and environmental organizations.

On May 10, 2019, a 5-year conservation agreement to support the recovery of the SRKW was signed by nine partners, including DFO, CCG, and TC, which formalized the participation of all parties in the ECHO Program, towards the shared goal of reducing acoustic and physical disturbance resulting from large commercial vessels operating in SRKW critical habitat in the Pacific Canadian waters.

Internal survey respondents believed that less progress has been made with respect to SLEB. This is consistent with other evidence that indicated that funded activities to support SRKW and NARW were prioritized over those for SLEB due to capacity-related issues.

External survey respondents provided higher ranking on the progress made with respect SLEB. Likely, this reflects the cumulative efforts from other organizations outside the federal government.

Internal and external survey respondents believed that, overall, progress has been made to mitigate the threats to the whale species. With respect to SLEB, internal respondents' views were different compared to the views of the few external respondents.



[22] Data on slowdown measures for the Pacific coast showed that in the 2019, 2020, and 2021 slowdown trials, underwater noise was reduced to approximately half of the baseline level (55%, 44% and 50% respectively), compared to the underwater noise reduction from the 2018 slowdown trial analyzed in spring of 2019.
[23] For more on the SRKW Accountability Framework, see: https://www.pac.dfo-mpo.gc.ca/fm-gp/mammals-mammiferes/whales-baleines/docs/srkw-framework-cadre-ers-2021-eng.html
[24] For more on the ECHO program, see: https://www.portvancouver.com/environmental-protection-at-the-port-of-vancouver/maintaining-healthy-ecosystems-throughout-our-jurisdiction/echo-program/

Evidence of progress made (continued)

Other observed progress/benefits

In addition to progress on mitigating threats, several other areas of observed positive changes and progress were identified by internal and external stakeholders.

Ability to make more targeted and flexible mitigation management decisions

- Measures such as area-based closures, fisheries closures, vessel slowdowns, and gear modifications were more specific and targeted as a result of the active and extensive monitoring activities.
- Better knowledge of the whales' distribution and preferred habitats allowed for site-specific management measures, both for fisheries closures and vessel slowdown measures.
- More and better whale detection monitoring (including the near real-time monitoring) and data informed and supported dynamic protective measures, even in areas that were not within historically known whale habitats.
- Adaptive approaches to management and risk mitigation measures provided the opportunity to increase their effectiveness each year.

Increased public awareness and access to data and information

- On the Atlantic coast, vessel owners/operators can subscribe to receive alerts when whales are detected. The number of accounts increased from 21 in 2019-20 to 450 in 2021-22 and the number of whale alerts also increased—from 2,700 in 2019-20 to 10,972 in 2021-22.

450 Whale alert subscriptions

10,972 Whale alerts sent

- The disturbance of SRKW as a result of whale-watching activities and recreational boaters' behaviour has decreased in some areas compared to several years ago, which may be a result of increased public awareness of the importance of recovery measures.

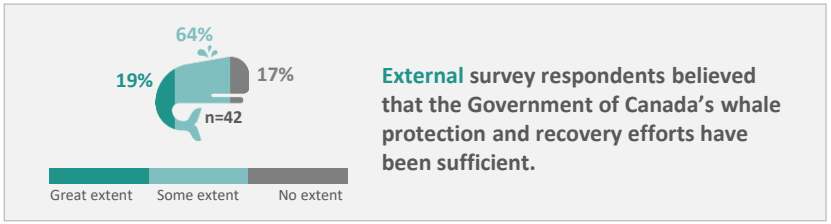
Enhancing and advancing research networks and capacity on whales in Canada

- There are more scientists and academics doing research on whales, which means more data and expertise to advance science in Canada, which directly addresses stated objectives of the funded initiatives.
- There are more partnerships and connections with other organizations, such as provincial governments, academics and non-governmental organizations (NGOs), which leads to new knowledge and new information.
- There are more partnerships with Indigenous communities and groups to support co-development of management measures and implementation of Indigenous-led marine stewardship and conservation programs.

Photo credit: DFO Facebook page

Areas of further focus for whale protection efforts

There are clear areas of progress on whale protection and recovery and external experts generally viewed the Government of Canada's efforts as sufficient.



External survey respondents believed that the Government of Canada's whale protection and recovery efforts have been sufficient.

Nevertheless, interviewees and survey respondents noted that there is more work to be done. Areas that require more attention in the future are compliance and enforcement, expanding the scope of current activities, and additional partnerships and engagement. Some detail on these areas are provided below.

More authority and capacity for stronger enforcement and control

- The success of whale protection measures can be impacted by challenges related to verifying compliance with measures and it was noted that increased enforcement capacity is needed, particularly with regards to on-water presence.
- The biggest gaps with respect to enforcement are with private/recreational boating activities[25], whale-watching restrictions, the use of whalesafe gear, and in interim sanctuary zones. The importance of addressing these gaps was reiterated regarding the new regulations on fishing gear modifications to be implemented (see Appendix C).
- Potential suggestions to address enforcement gaps included: requiring AIS tracking on smaller vessels, introducing mandatory slowdown requirements for small vessels, implementing approach distance restrictions beyond 400m[26], and having shared authority with First Nations for monitoring compliance.
- Data and information on contaminants suggest that remediation is needed in several areas (e.g., contaminants left in the environment by sources that are no longer present).

Expanding the scope of whale protection activities

- Monitoring and related management measures need to be implemented beyond the geographic areas currently covered by whale-related funding, as well as to other species (e.g., the blue whale).
- Underwater noise reduction measures need to be established for small vessels and other sources of noise.

Improving availability, access, and usability of data and information for decision makers

- There is a need to further enhance the partnership, collaboration, and knowledge exchange with organizations external to Government of Canada (e.g., industry associations, academia, other levels of government, NGOs, and Indigenous communities and groups).
- More tools and mechanisms are needed for data sharing and integration in more concise, user-friendly formats.

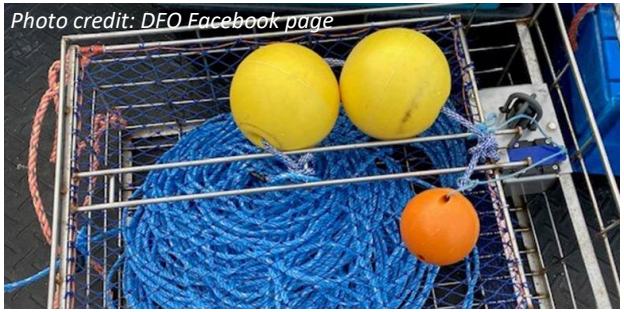


Photo credit: DFO Facebook page

[25] Seventy-one per cent of boating infractions around whales involved recreational vessels (Source: 2021 Salish Sea Soundwatch report: https://whalemuseum.org/pages/soundwatch-boater-education-program).
[26] Based on some recent studies, disturbance effects, especially on foraging, go beyond 400m (Holt et al. 2021b, doi: 10.3389/fmars.2020.582182).

Indigenous views on whale protection objectives and progress

Indigenous communities and groups shared recommendations and priorities for whale protection and recovery, including working in partnership. Alignment between Indigenous priorities and objectives varied by threat, species, and region and their views on the effectiveness of recovery efforts were mixed.

Recommendations and priorities for whale protection and recovery

Indigenous communities and groups valued the use of an ecosystem approach for protection and recovery of whales, rather than managing threats in silos. They also felt regulatory action, coupled with strong enforcement was critical, and there was a desire to have shared responsibility and authority. Representatives on the Atlantic coast were interested in guiding trials related to new innovations, while Pacific coast First Nations were interested in leading monitoring and enforcement efforts (see box for examples of funded programs).

Indigenous communities and groups also felt it was important to build on existing, Indigenous-led successes to maximize impact, such as enhancing Indigenous guardian programs, and weaving Indigenous Knowledge with western science to best understand regions and inform measures. Priority areas included:

- fisheries and predator management;
- forestry management and pollution monitoring;
- regulating and monitoring whale-watching and eco-tourism industries; and
- restricting vessel speed and traffic.

Alignment between Indigenous priorities and Government of Canada objectives

There was agreement amongst First Nations that the SRKW Initiative (the Initiative) was necessary and important and there was some alignment between the priorities of First Nations and the objectives of the Initiative. A few gaps where Nations felt more effort was needed included: enhancing prey availability, addressing contaminants, and reducing whale harassment. Nations also desired more time to meaningfully contribute to the decision-making process and a more collaborative approach to implementation to improve compliance and minimize impact on their Aboriginal and treaty rights.

Representatives in Atlantic Canada agreed with certain measures, including speed restrictions and navigation exclusion zones; however, raised concerns with respect to the manner in which fisheries closures were implemented across areas, regardless of whale presence in the immediate area. Most representatives interviewed felt the PDAs' efforts to protect the NARW were balanced and promising, and some commended PDAs for exceeding expectations by proactively addressing requirements of the *United States Marine Mammal Protection Act* and using innovative approaches to address threats. Representatives interested in SLEB recovery and protection felt measures were appropriate and spoke of the speed restrictions and no-go zones in the Saguenay-St. Lawrence Marine Park as being particularly important. They also felt more could be done to address contaminants and to combat climate change in general, given the role it plays in warming the waters of the estuary.

Collaboration with First Nations in Pacific region National Park Reserves (NPR)

Over the course of the Initiative, PC established multiple contracts and/or contribution agreements with First Nations in Gulf Islands NPR and Pacific Rim NPR. Funds were committed to enhance on-water programs, including Indigenous guardian programs, that focused on SRKW monitoring and marine stewardship and protection. At the end of the Initiative, discussions were underway with several additional First Nations to support new and existing Indigenous-led programs to protect and recover SRKW and the ecosystems on which they rely.

Indigenous views on whale protection objectives and progress (continued)

Perspectives on effectiveness of the protection measures and efforts

First Nations on the Pacific coast shared ongoing concerns about the health and survival of the SRKW. Some Nations noted a lack of clear, quantifiable targets, which made it difficult to understand how measures would be assessed for effectiveness. Where efforts had been made, some Nations questioned the link between measures and benefits to the whales, while others indicated efforts to date were insufficient. Furthermore, several Nations found on-water presence inadequate to ensure compliance, which was perceived to be a significant barrier to achieving progress. Many Nations felt more collaborative partnerships were needed to enhance or support existing guardian programs and that First Nation authority to monitor for compliance and engage in enforcement activities needed to be recognized and better supported.

Most representatives interviewed from Quebec and Atlantic Canada, felt efforts to reduce threats to the NARW were sufficient, given the complexity of the situation; however, they are not yet seeing improvement to the health of the whales. Similarly, while representatives interested in the protection and recovery of the SLEB agreed that efforts were sufficient, they were not encouraged by what they were observing in their region, including fewer pregnant females and deaths of young beluga.

Ultimately, all communities and groups, regardless of region, believed there is a need to continue or enhance efforts to recover and protect the target whale species.

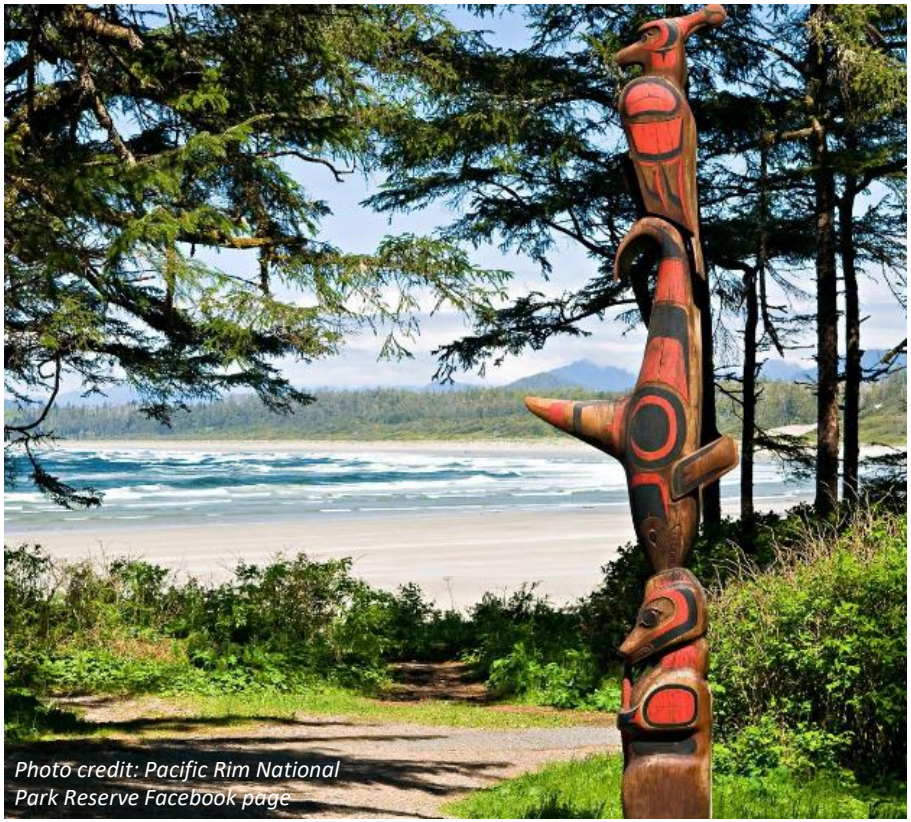


Photo credit: Pacific Rim National Park Reserve Facebook page

Evaluation findings

Lessons learned for the delivery of future programming

Key findings:

- There were unintended impacts, both positive and negative, on the ecosystems, industry, and communities as a result of whale protection and recovery measures. However, there was a lack of data to fully substantiate these impacts.
- A number of best practices were noted as playing an important role in ensuring the successful delivery of whale-related programming. At the same time, several delivery challenges have been identified that could inform future whale-related programming.

Photo credit: Michael Aleo on Unsplash

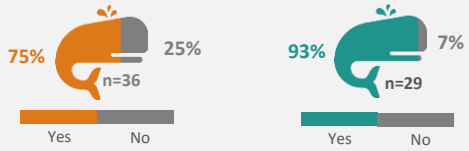
Unintended impacts

There were unintended impacts, both positive and negative, on the ecosystems, industry, and communities as a result of whale protection and recovery measures. However, there was a lack of data to fully substantiate these impacts.

Views on unintended impacts

Both internal and external stakeholders believed that there have been numerous unintended socio-economic and ecological impacts as a result of whale-related activities. Some of those were also noted in some studies and documents. Even though there was a lack of data and information to be able to fully substantiate these impacts, ones identified through multiple evaluation sources are summarized below.

Internal and external survey respondents said that there have been unintended impacts as a results of the implementation of whale-related measures.



Examples of unintended impacts viewed as positive

- Measures taken have likely had a positive impact on other species.
- New technologies, knowledge, databases, guidelines, and surveillance information will be able to inform decision-making on other ecological measures.
- While the development of partnerships was an objective of the initiatives, the extent to which this would happen was unexpected, including the extent to which those partnerships facilitated the development and sharing of knowledge.
- Reduction of pollutants, noise, ship strikes, and gas emissions from vessels slowing and converting to electric systems can have other ecosystem benefits.
- The lobster and crab fishing season starting earlier had a positive impact on fishers as it allowed harvesters to reach quota before whales were present.

Examples of unintended impacts raising concerns/uncertainty

- Impacts on the fishing industry: a decrease in fishing revenues due to fisheries closures, which mainly impacts Indigenous and other coastal communities, and the cost of new whalesafe fishing gear, which can disproportionately impact smaller players in the industry.
- Impacts on sportfishing and tourism (e.g., whale watching, charters, cruises and related incomes) due to speed restriction measures and area closures.
- Impacts on the shipping industry due to speed restrictions (e.g., delaying the movement of goods).
- Displacement of resources, which can affect research and attention for other marine mammals (e.g., seal programs; other cetaceans such as fin whales, blue whales, harbour porpoise).
- Negative impacts can be redirected to other species or geographic areas (e.g., Canadian commercial whale watchers focus on other species or move to different waters to circumvent the restrictions).
- Other potential ecological impacts that need further exploration (e.g., increase of other species' population and their environmental impact; weakening rope creates additional ocean debris and ghost gear, which in turn increases risks for whale and other species mortality).

Lessons learned for delivery of future programming

A number of best practices were noted as playing an important role in ensuring the successful delivery of whale-related programming. At the same time, several challenges have been identified that could inform future whale-related programming.

Best practices in the delivery of whale-related measures

Three areas of best practices were identified as being important to the successful implementation of whale-related measures and activities: external partnerships and coordination, interdepartmental coordination, and the use of an adaptive approach. Each of these are explained in more detail below.

External partnerships and coordination

- The establishment of strong relationships with external partners allowed for enhanced coordination and integration, thus increasing the amount of knowledge, expertise, and data for decision-making.
- Dedicated efforts and resources by PC facilitated engagement with First Nations, which resulted in improved relationships and collaboration on monitoring projects.
- The facilitation of SRKW Multi Nation Tier II meetings by an external Indigenous consultant allowed for more effective and culturally appropriate engagement and discussions.
- Good engagement and communication with stakeholders meant they were willing to participate in the solution (e.g., the shipping industry adding time to their transits through the Salish Sea to minimize impact on SRKW).

Interdepartmental coordination

- Good working relationships between PDAs enabled effective collaboration and coordination.
- Extensive joint outreach, education, and innovative efforts from the various PDAs, especially on the Pacific coast, increased awareness and education of users of the ocean resources, resulting in adherence to measures.
- Joint patrols and the existence of a bi-monthly, interdepartmental enforcement meeting on the Pacific coast, allowed for the sharing of knowledge, information, and practices, which maximized the use of available vessels for patrols and increased the ability to enforce more measures. Challenges related to the enforcement were significant for some of the measures (e.g., voluntary measures, approaching distances, contaminants), so coordination was key.

Adaptive approach

- Because it was not clear at the time of launching the Whales Initiative what exactly would be needed, measures and activities were planned using an adaptive strategy, which allowed for adjustments to activities based on sound advice, solid and evolving science, surveillance and feedback from stakeholders and partners.

Lessons learned for delivery of future programming (continued)

Challenges related to the delivery of whale-related programming

In addition to the challenges already identified in the section on implementation, the evaluation identified a number of delivery challenges that could help inform future programming decisions.

Lack of resources for Indigenous engagement

- PC was the only PDA that requested, and was granted, dedicated resources for Indigenous engagement for whale-related activities.
- A lack of funding for this work in other PDAs reduced the capacity and willingness of Indigenous communities and groups for engagement activities.
- Indigenous communities and groups have raised interest in being involved in compliance and monitoring as well as scientific activities, if they could be supported for it.

Challenges with funding

- Multiple funding envelopes meant that funded activities were difficult to coordinate.
- All funding was B-based (i.e., time-limited), thus it was difficult for PDAs to make longer-term plans (e.g., to hire staff) and had impacts related to external partners (e.g., limited their confidence in the long-term commitment of the government to whale protection).
- There was a lack of resources for some activities, such as enforcement, marine mammal response (e.g., towing, necropsies, disentanglement), and activities in support of SLEB.

Limitations with performance measurement

- A lack of appropriate performance indicators to assess the effectiveness of measures and impacts related to the mitigation of threats made it difficult to fully measure progress.
- It was mentioned that this is partially attributable to the fact that: activities were planned at a higher level to allow for flexibility, and; whale protection was relatively new line of work for some PDAs, thus, the limitations of some of the originally defined indicators were not anticipated at the start.

Challenges with governance and coordination

- There was no funding provided for a secretariat function, which had an impact on the ability of DFO to coordinate with other PDAs and to report on implementation progress nationally.
- Timelines related to some activities and measures were found to be operationally not feasible, such as those related to whalesafe fishing gear trials and Indigenous engagement.
- Broad communications across PDAs could be improved (e.g., on the decisions and actions taken, approach, information).

Limited sharing of information and data

- Sharing and accessibility of data, including real-time data, was challenging for some stakeholders, as well a lack of data storage space. This had an impact on the usefulness of the data and information available.
- Data is often collected following different protocols and reported in different formats and platforms. Therefore, in some cases data sets are not coherent with other data sets, or not useful for the other teams (e.g., aerial surveillance data).

Cross-jurisdictional and regulation complexities

- The cross-jurisdictional nature (e.g., provincial, municipal, interdepartmental) of the activities made it hard to manage certain legislative tools and to implement controls for pollutants reduction and management.
- Legislation/regulatory amendments take time (e.g., establishing sanctuaries, requirements for whalesafe fishing gear).
- These challenges are even more significant on the Atlantic Coast where responsibilities are divided across several provinces.

Conclusions and considerations

Conclusions

Investments made under the four key whale-related initiatives resulted in the implementation of a number of measures and activities that contributed to the protection and recovery of the three endangered whale species.

Design and delivery

PDAs generally had the legislative and regulatory tools to effectively carry out their roles and responsibilities for whale-related programming. Progress has been made with respect to the implementation of activities related to legislative and regulatory tools, although some gaps and challenges remain. In addition, the evaluation found that funded activities were well-aligned with the programs, priorities, and mandates of PDAs; and with international guidelines and practices of other jurisdictions.

While governance was not a key focus of the evaluation, evidence suggested that some aspects related to governance were successful, such as collaboration opportunities, coordination of activities, and the technical working groups. However, some opportunities for improvement were identified, such as better leadership and definition of roles and responsibilities, and better planning and integration of activities.

PDAs have undertaken a significant number of activities to support the protection and recovery of the targeted whale species, many of which were implemented as planned. Measures and activities were planned using an adaptive strategy, which allowed for timely adjustments to activities based on sound advice, science, and Indigenous and stakeholder input. PDAs faced some challenges during implementation, particularly with respect to COVID-19 and capacity, which affected the implementation of some planned activities.

The three targeted whale species are significant to Indigenous Peoples' cultures, communities, and the ecosystems on which they rely. PDAs put processes in place to engage Indigenous communities and groups in whale-related programming and there are examples of Indigenous Knowledge being woven into that programming. However, their degree of involvement varied. Several areas for improvement to the consultation and engagement processes were identified by Indigenous communities and groups.

Progress on addressing threats

The knowledge base to support decision-making has increased significantly as a result of new whale-related data collection, monitoring, Indigenous Knowledge and Science, and scientific research activities. However, there is room for improvement in terms of the accessibility, integration, and sharing of data to facilitate its use. The research and monitoring work undertaken over the past five years does not address all existing and emerging information needs, thus data and information gaps remain.

While it is early to assess the full effectiveness of some measures, the funded activities were viewed as appropriate to achieve results.

Progress has been made on mitigating risks to whales. There has been more significant progress in reducing entanglements and vessel strikes compared to progress addressing other threats (e.g., prey availability, acoustic disturbance, and contaminants), which typically require more time. Indigenous communities and groups shared recommendations and priorities for whale protection and recovery, including more partnerships. Alignment between Indigenous priorities and objectives varied by threat, species, and region and their views on the effectiveness of recovery efforts were mixed.

Conclusions and considerations (continued)

There were some unintended impacts viewed as positive as a result of whale protection and recovery measures, including: new data and information that will be able to inform decision-making on other ecological measures, other species have likely benefited from the measures, and other impacts related to vessel slowing measures (e.g., reduction of pollutants). There were also some unintended impacts that raised concerns/uncertainty, including those to the commercial fishing, sportfishing, tourism, and shipping industries, for instance. However, there is currently a lack of data to fully quantify the impacts related to these concerns/uncertainties.

Lessons learned

The evaluation identified a number of best practices that were considered important to the successful implementation of whale-related measures. These included the establishment of strong relationships with external partners, good working relationships between PDAs, and the adaptive strategy used for the implementation of whale-related activities. These practices contributed to enhanced coordination and sharing of resources, knowledge, information, and practices; and allowed for adjustments to activities based on sound advice, evolving science, and feedback.

Considerations for future programming

There are no recommendations related to these findings. Rather, the evaluation identified some areas that should be considered to inform future programming decisions.

- **Resources for Indigenous engagement**: PC was the only PDA that had dedicated efforts and resources to facilitate engagement with First Nations, which resulted in improved relationships and collaboration on monitoring projects. There is continued interest from Indigenous communities and groups to be involved in whale-related protection activities; however, a lack of funding to participate in engagement activities has reduced their capacity and willingness.
- **Funding:** There was a lack of resources for some activities, such as enforcement, marine mammal response, and SLEB. In addition, the time-limited funding made it difficult to plan long-term, including for staffing, and to demonstrate long-term commitment to whale protection.
- **Governance and coordination**: The lack of funding for a secretariat function and other internal services, had an impact on the ability of DFO to coordinate with other PDAs and to report on implementation progress at the national level.
- **Data sharing:** Although there has been an increase in new whale-related data and information, data storage, sharing, and accessibility was found to be challenging for some stakeholders, which impacted the usefulness of data and information.
- **Performance measurement:** A lack of appropriate performance indicators to assess the effectiveness of measures and mitigation of threats made it difficult to fully measure progress and appropriateness. Better data management practices and performance indicators would facilitate that, now that PDAs have built baseline knowledge of whale protection.
- **Regulatory complexities**: In addition to legislation/regulatory amendments taking time, the cross-jurisdictional nature of the activities made it hard to manage certain legislative tools, especially on the Atlantic Coast. This has an impact on the implementation of measures, as well as on their enforceability.


Photo credit: DFO Facebook page

Appendices

Photo credit: Michael Aleo on Unsplash

Appendix A: Detailed evaluation methodology

The evaluation was conducted using an evaluation framework, which included the questions summarized on page four. Data was collected through the following methods and evidence was triangulated to decrease potential deficiencies with any one method and to develop the overall findings.

Document review

The evaluation team reviewed over 200 internal and external documents to understand the context and background of the whale-related programs, activities, and measures; and to assess design and delivery, progress on addressing threats, and lessons learned for future whale-related programming. Materials reviewed included, but were not limited to, program documentation, contribution agreements, applicable legislation and regulatory documents, mandate and priority-setting documents, and external reports and public websites.

Limitations and mitigation

Due to the large number of documents received, it was necessary to prioritize and sample certain categories documents.

Interviews

The evaluation team conducted a total of 70 interviews with 72 individuals, which included program representatives from DFO, TC, ECCC and PC who were involved in whale-related programming and Indigenous representatives.

70
Interviews conducted

	DFO	TC	ECCC	PC	Indigenous representatives
Scoping phase	19	12	12	4	--
Conduct phase	4	6	5	3	5

Interviewees were selected to ensure that input was received from a mix of program representatives across all coastal regions and national headquarters. Interviews were structured to discuss a range of questions related to design and delivery, progress on addressing threats, and lessons learned, including the four activities examined in-depth.

Limitations and mitigation

Due to the COVID-19 travel restrictions, interviews were conducted virtually. Given the large number of individuals involved in whale-related programming, it was not possible to interview everyone, thus a survey was also administered to program representatives.

In addition, due to the large number of Indigenous communities and groups in Quebec and Atlantic Canada, a sample was invited to participate in an interview. Thus, the interviews with Indigenous communities and groups are not representative. Furthermore, interviewees were not Indigenous and could not speak on behalf of Indigenous Peoples.

For more information on other ways in which Indigenous views were included in the evaluation, see Appendix B.

Internal and external surveys

Two surveys were conducted: one for program representatives, and one for external stakeholders.[27] The surveys complemented the evidence gathered during interviews and were designed to align with the interview guides so a similar analysis could be conducted across both.

The surveys were administered online between July 26 and September 6, 2022, with reminders sent twice.

[27] Originally, a questionnaire with open-ended questions was distributed to a selection of external stakeholders who were involved in species at risk recovery and action plans; however, few responses were received. Thus, the approach was changed to an on-line survey and the survey population was expanded to include individuals participating in government-led working groups.

Appendix A: Detailed evaluation methodology (continued)

Internal and external Surveys (continued)

Survey invitations were sent to:

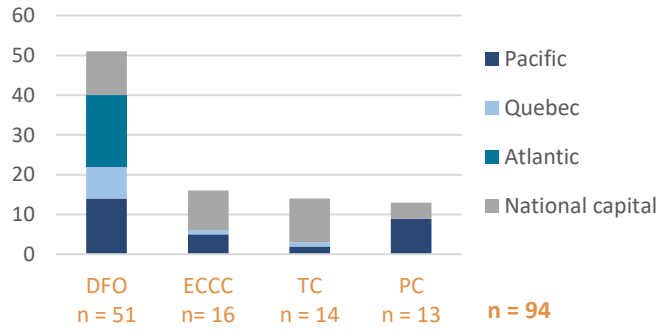
- 235 program representatives who were selected based on their involvement in the whale-related initiatives, including participation in the working groups and coordination committees.
- 300 external experts, both within Canada and internationally, who were identified based on international literature review and participation in recovery strategies and the working groups.

94 Responses from program representatives (40% response rate)

52 Responses from external stakeholders (17% response rate)

While the survey data is not statistically representative, the profile of survey respondents provides a good coverage of the organizations and geographical regions (Figure 4), roles, whales species and activity categories. Thus, the two surveys offered valid evaluation evidence on various aspects and perspectives.

Figure 4: Distribution of internal survey respondents, by PDA and region[28]



The involvement of internal and external respondents, by whale species and activity category is illustrated below. Percentages add to more than 100 because multiple responses were possible, when people have multiple roles.

	NARW	SRKW	SLEB	Research and monitoring	Management measures	Compliance/ enforcement	Engagement/ partnerships
Internal n = 94	50%	62%	29%	30%	31%	17%	22%
External n = 52	53%	53%	10%	73%	69%	33%	59%

Limitations

- The survey was administered over the summer holiday and during the peak season of some operational and research activities, thus it may have been more challenging for some respondents to complete the survey. To mitigate this, the surveys were left open for four weeks each.
- The evaluation team could not control who responded to the surveys, which limited the ability to ensure that profiles of the potential and actual survey respondents are better aligned.
- The evaluation team considered with caution survey responses from categories that potentially could have been disproportionally represented and included them in the analysis only when triangulation with other sources was possible.

Administrative data review

The evaluation team reviewed and analyzed three categories of data:

- whales reporting dashboards;
- performance information profiles and respective corporate reporting; and
- other internal program sources (e.g., used by program areas to track progress).

[28] Pacific region includes British Columbia and Yukon; For DFO, Atlantic includes three regions (i.e., Maritimes, Gulf, and Newfoundland and Labrador); National capital represents the location of the PDAs national offices. Of note, many regional activities in the Quebec and Atlantic regions were managed at the national level, which explains the low regional representation from most PDAs.

Appendix A: Detailed evaluation methodology (continued)

Administrative data review (continued)

Limitations and mitigation

- Given that performance data collection and monitoring related to the three endangered whales is new, data sets were incomplete for much of the evaluation period (e.g., many data series were only available for one or two years).
- Many performance indicators provided limited information on achieving results; rather, they reported progress on delivery of outputs.
- The PDAs collected data for different purposes and used different reporting tools. Since the whale initiatives did not support dedicated administrative capacity (e.g., secretariat) to establish a methodology for data collection and reporting, it was challenging to develop a standardized methodology to conduct the data analysis.
- As a rigorous quantitative analysis could not be performed, the evaluation focused instead on triangulating information gathered from multiple lines of evidence to address questions that stemmed from the analysis of administrative data. Data information was included only when it added value to the overall performance story and some pieces of data were excluded when they were judged unreliable.

Data limitations are outlined as well throughout the report, where relevant.

Case study

The evaluation team conducted a case study on Indigenous involvement in the SRKW Initiative. Appendix B provides more details on the methodology followed and limitations of this case study.

Environmental scan

The evaluation team completed a review of alternative design and delivery models in foreign programs related to whale protection and recovery, including those in the United States, European Union, Australia, New Zealand, and the Netherlands. The objective was to compare Canadian activities with similar programs elsewhere. An extensive review of publicly available Canadian and international reports, regulations, and other information on foreign programs was conducted.

Limitations and mitigation

It was difficult to locate complete, publicly available data on all relevant parameters for foreign programs, making a full comparison impossible. For these reasons, the evaluation did not attempt a true comparison between Canadian and foreign programs, but rather sought information that could provide global context and useful alternatives to Canadian measures and activities and relied strongly on views from external experts that were gathered through the survey.

In addition, four activities were examined in-depth to understand the achievement of results and related challenges, and to identify lessons learned for future planning: voluntary slowdown measures, marine mammal response providers, whale-related aerial surveillance, and whalesafe fishing gear/technologies. This information is presented in Appendix C.

Appendix B: Case study on Indigenous involvement in the Southern Resident Killer Whale Initiative

Case study purpose and scope

The SRKW Initiative (the Initiative) was implemented in 2019 to extend the Whales Initiative and focus more rapidly on addressing imminent threats to the SRKW.

The need to include a case study on Indigenous involvement as part of the evaluation was identified through scoping interviews with senior management and program officials across the four PDAs, given the significance of the SRKW to First Nations. The case study focused on management measures specific to SRKW as there has been a concerted effort to build partnerships with coastal First Nations in British Columbia (B.C.), through funding and ongoing relationship building, to implement and monitor the measures to protect and recover the SRKW.

Nations were invited to participate in the case study by responding to a number of questions with the objective of understanding:

- how they were engaged in the Initiative;
- how their input informed the development and implementation of the interim management measures; and
- how they perceived the impact of the measures on SRKW recovery.

The case study was designed to provide evidence on what worked well and where improvements could be made related to Indigenous engagement and consultation on the SRKW management measures process. While funding for the Initiative was from 2019-20 to 2023-24, the case study includes First Nation involvement in activities from spring 2019 to fall 2022.

Methodology

The evaluation team worked with program staff within the PDAs to determine the best approach to gather input from Nations. It was recommended that the team use existing engagement processes, including the multi-Nation Tier I and II process described on page 18. The team introduced the case study at the Tier I and II meetings in June 2022 and attended two additional bi-lateral meetings with Nations, at their request. Following these meetings, information on the case study, including the questions, were sent (via email or online submission) to all 37 Nations potentially impacted by the SRKW interim management measures with an invitation to participate in the evaluation. Reminders were sent in the fall of 2022. To complete the case study, the team analyzed the documentation available, including, but not limited to, 15 letters from Nations to the Government of Canada and the associated response, summaries of 15 multi-Nation meetings, summaries of four bi-lateral meetings, and five responses submitted to the evaluation team.

Limitations

Due to the number of Nations, and their dispersion across a large geographical area, the evaluation team had to rely on electronic communication and was not able to directly engage with each Nation. Efforts to engage Nations in the case study resulted in responses from five Nations. This, combined with the documents submitted by Nations to the PDAs over the course of the Initiative, resulted in representation from 26 of the 37 Nations potentially impacted by the measures. As such, the perspectives outlined in this case study are not representative of all First Nations who were engaged in or potentially impacted by the Initiative. In addition, there is acknowledgement that all Nations are unique and thus, the analysis was conducted based on individual Nations. Key themes were identified and summarized in this document for analysis purposes.

70%
of B.C. coastal First Nations (26 out of 37) potentially impacted by the measures were represented in the data reviewed.

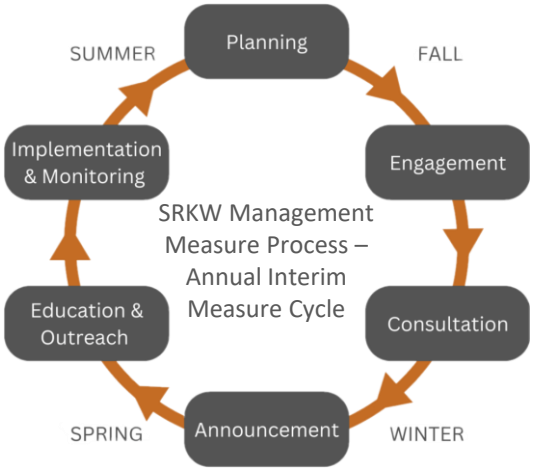
Observations from the case study are provided on the following pages.

Appendix B: Case study on Indigenous involvement in the Southern Resident Killer Whale Initiative (continued)

First Nations engagement in the Initiative

The PDAs followed a cycle for reviewing and finalizing interim measures in consultation with First Nations and stakeholder groups (Figure 5). The timing of each step in the cycle was designed to align with when the SRKW typically return to Canadian waters to ensure measures were in place in advance of their arrival. Initially, planning first took place with the Indigenous and Multi-stakeholder Advisory Group (IMAG) and the SRKW technical working groups to develop proposed measures, which included representation from Nations. Federal partners also organized webinars and hosted bilateral meetings, at the request of Nations. Nations were then informed of measures being contemplated by the PDAs through multiple methods of engagement (i.e., webinars, website, e-survey) and official consultation to gather feedback took place during bilateral meetings and through several rounds of written correspondence. Following the announcement of annual interim measures, PDAs informed and educated those impacted to build understanding and buy-in in advance of implementation. Throughout the implementation phase, the impacts of the measures were monitored and feedback from Nations fed into the upcoming year's planning phase.

Figure 5: The SRKW management measures process
This figure shows the annual cycle for the interim measures, including the steps taken each year to finalize each interim suite of measures.



Over time, and in response to concerns from Nations, adjustments were made to the timing of the steps in the cycle to maximize time for review and discussion within and between Nations and to position First Nation input before that of other stakeholders, as described in Figure 6.

Figure 6: Key engagement and consultation activities undertaken with First Nations between 2019 and 2022 under the SRKW Initiative

2019 – 2020

- Each winter, consultation letters, webinars, and bi-lateral meetings were held to engage and consult on the upcoming year's measures.
- Each spring, Nations were informed of the measures by letter.
- Each fall, consultation letters, webinars, and bi-lateral meetings were held to review the previous year's measures and consult on upcoming year's measures.
- End of 2020, the multi-Nation Tier I and II process was developed in response to feedback from Nations and to complement the official bi-lateral consultation process.

2021

- In spring, PDAs drafted a framework for collaboration on development and implementation of the SRKW management measure process for review by Nations at the multi-Nation tables.
- First SRKW Tier I and II meetings were held and facilitated by an Indigenous consultant, where framework for collaboration was reviewed.
- Engagement started earlier than previous years (i.e., summer versus fall) allowing more time for review and discussion of measures.
- Engagement with Nations occurred before IMAG and the technical working groups so their input could be incorporated into proposed management measures.

2022

- Work was done to optimize the multi-Nation process, including developing a comment tracker, reviewing and refining the guiding framework for collaboration on SRKW management measure process, and identifying First Nation priorities for more in-depth discussion.

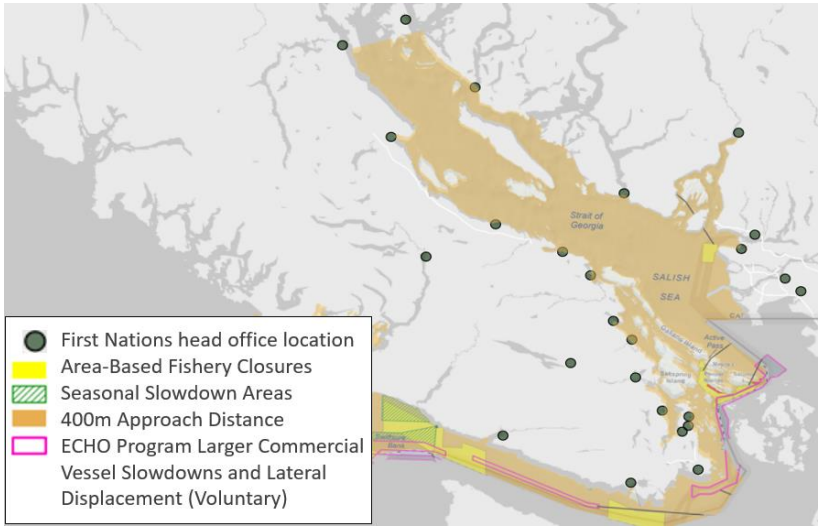
Appendix B: Case study on Indigenous involvement in the Southern Resident Killer Whale Initiative (continued)

First Nations engagement in the Initiative (continued)

Using the process described on the previous page, the 37 First Nations potentially impacted by the measures were approached by federal partners to discuss the development and implementation of annual interim measures. The extent of engagement depended on several factors specific to each Nation, such as:

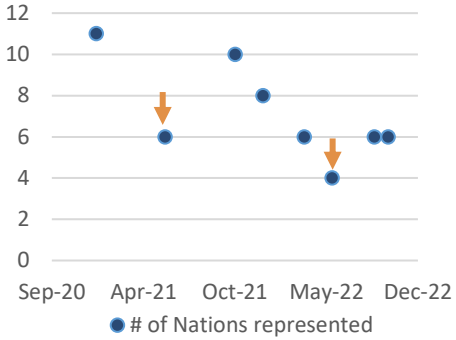
- the spiritual and cultural significance of the SRKW to their people;
- the extent to which their marine territory overlapped with the geographical scope of the management measures (Figure 7);
- their community priorities; and
- their capacity to participate in engagement activities.

Figure 7: Locations of head offices for Nations engaged in the Initiative relative to the geographical scope of 2022 interim measures.



While the Tier I process was deemed of value to some Nations as a forum for frank and effective discussion between Nations, participation levels at both Tier I and II meetings were low. Between January 2021 and October 2022, 20 of the 37 Nations engaged in at least one multi-Nation meeting. However, of those 20, none were able to attend all meetings and only two attended all but one. Participation was particularly lower in the spring and decreased year over the year (Figure 8).

Figure 8: First Nation representation at multi-Nation meetings[29]



Those in attendance at the Tier II meetings expressed ongoing concerns about the limited representation around the table. The following reasons for low attendance were mentioned:

- inadequate notice of meetings and insufficient time for in-depth and meaningful discussion;
- a lack of transparency on how previous input was included in decision-making, which led to frustration and a lack of confidence in the process from some Nations;
- a lack of financial support for Nations to participate in the process. While meeting organizers referred Nations to available funding for engagement across Government-led initiatives, there was no funding specifically available for engagement in SRKW management processes; and
- the fact that the multi-Nation process did not meet the Government's duty to consult and that decisions around measures impacting their Aboriginal rights and title need to be discussed on a government-to-government basis. As a result, some prioritized bilateral discussions over other engagement opportunities.

Furthermore, many Nations felt consultation prioritized views of industry and occurred too late in the annual review process, only after key decisions had been made.

[29] The first multi-Nation meeting in September 2020 was a multi-Nation meeting that preceded the establishment of the Tier II table. It is included in the figure as the meeting included multiple Nations, served a similar engagement function and contributes to understanding variations in attendance at multi-Nation meetings over time.

Appendix B: Case study on Indigenous involvement in the Southern Resident Killer Whale Initiative (continued)

Involvement in informing the development and implementation of measures

Despite these engagement challenges, a few successful examples were found of co-design and co-development of management measures or Indigenous-led delivery in their marine territories.

The Pacheedaht First Nation example

In 2022, consultation and collaboration between Pacheedaht First Nation and TC led to a different approach to management in Pacheedaht marine territory. In place of establishing an Interim Sanctuary Zone in Swiftsure Bank, an area of critical importance to Pacheedaht First Nation, two new slowdown areas were implemented. This approach considered both Indigenous Knowledge (IK) and new scientific information about SRKW habitat use and foraging behaviour.

Additionally, through contribution agreements, funding was provided by PC to several Nations whose territory overlap with Pacific Rim and Gulf Islands National Park Reserves, to support First Nation leadership of recovery and protection efforts. Funding was dedicated to capacity building for Indigenous-led protection programs and played an integral role in advancing work related to the SRKW management measures, including, but not limited to:

- identifying Indigenous-defined priorities related to the survival and recovery of SRKW;
- providing culturally relevant outreach and education, such as raising awareness among Indigenous youth;
- hiring additional technicians and enhancing monitoring and compliance promotion work; and
- promoting Indigenous ecological knowledge and stewardship of natural and cultural heritage of traditional territories.

The role of Indigenous Knowledge in informing the development and implementation of measures

During the development of the SRKW measures, IK was sought through various forums including certain technical working groups, the IMAG, the multi-Nation process, and bilateral meetings with First Nations.

While some Nations felt the management strategy lacked inclusion of IK, others expressed the desire to build trusting relationships prior to sharing IK to ensure proprietary information would be respected and protected. Several Nations also suggested building partnerships and capacity for First Nation management and monitoring, to enable the use of IK in real-time, through action on the water.

The PDAs recognized the necessary role of IK in SRKW whale conservation efforts, and examples of knowledge shared by some Nations were noted, including:

- information on traditional marine use and occupancy;
- traditional and changing SRKW movement and foraging habits;
- distribution and behaviour change of chinook salmon; and
- information on changing ecosystems.

Weaving together IK with western science has the potential to help decision makers to gather an optimal understanding of regions and species' behaviour and to better inform the development and implementation of a holistic, ecosystem-wide conservation and management plan.

While changes were made to the most recent annual cycle, several Nations shared ongoing disagreement with the consultation process adopted by the PDAs. They expressed a desire for a more cooperative approach, one that would result in more substantive representation of their input, expertise and experiences into decision-making processes, through in-depth consultation with community members, elders, and other knowledge keepers.

Appendix B: Case study on Indigenous involvement in the Southern Resident Killer Whale Initiative (continued)

Perspectives of the impact of measures on SRKW protection and recovery

Nations shared ongoing concerns about the health and survival of the SRKW during Tier II meetings and in their consultation letters to the PDAs. They underscored the importance of protecting the SRKW, their ecosystem and habitats, and the urgent need for ongoing action.

During meetings, some Nations noted a lack of clear, quantifiable targets, which made it difficult to understand how measures would be assessed for effectiveness. Where efforts had been made, effectiveness was unclear and some Nations questioned the link between measures and benefits to the whales.

Of the five Nations who provided input specifically for the case study, two shared perspectives on the impacts of the measures: one indicated the impact of the measures needed to exceed the damage done by anthropogenic change, and they felt the measures were having little impact in this regard. The other Nation felt efforts required a higher degree of due diligence in taking a comprehensive approach to protection and recovery and that measures, to date, had been insufficient in achieving this objective.

Furthermore, several Nations found on-water presence inadequate to ensure compliance, particularly regarding whale-watching and eco-tourism industries, and these gaps in monitoring were perceived to be a significant barrier to achieving progress. Some Nations also felt voluntary measures, such as voluntary fishery management measures, were ineffective. Many Nations felt more collaborative partnerships were needed to enhance or support existing guardian programs and that First Nation authority to monitor for compliance and engage in enforcement activities needed to be recognized and better supported.

Photo credit: DFO Photo Bank

Conclusion

Overall, the case study provided evidence that efforts were made to engage with First Nations regarding the development and implementation of the SRKW interim management measures. Positive aspects include the establishment of the facilitated multi-Nation process, and the adjustments made to the critical path to accommodate requests for more time to review and discuss proposed management measures before finalization. However, there is room to improve participation levels and to ensure First Nations see their voices included in final decisions in more substantive ways. For instance, PDA need to ensure adequate notification of meetings and time for in-depth and meaningful consultation, dedicate funding to support participation, and better address First Nations' feedback in a transparent and timelier manner.

There are some anecdotal examples of how First Nations' input and IK informed the development and implementation of the interim management measures. Most notable, PC experienced some success in building new and furthering existing partnerships with Nations in the Pacific Rim and Gulf Islands National Park Reserves for the delivery of key activities, including education and outreach and monitoring and compliance. Success was credited, in part, to administering funding directly to First Nations to support Indigenous-led programming.

Finally, better targets are needed to be able to assess the impact of the measures and more work needs to be done to address threats to the SRKW and protect their ecosystem and habitats.

These gaps present an opportunity for further collaboration between PDAs and First Nations on achieving recovery and conservation goals.

Appendix C: Summary of activities examined in-depth

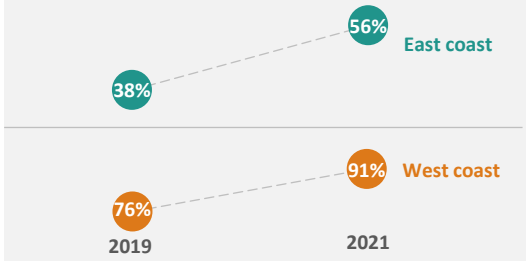
A) Voluntary slowdown measures

Voluntary slowdown measures have been implemented by the Government of Canada[30] since 2017. In addition to voluntary measures, mandatory measures are announced and implemented each year, supported by the authorities of the *Canada Shipping Act* and the *Species at Risk Act.* Since 2019, some measures were coordinated with the United States. Measures are based on advice and input of many stakeholders from across government, marine transportation industry, fishers, scientists, environmental groups, Indigenous communities and groups, as well as data from extensive monitoring.

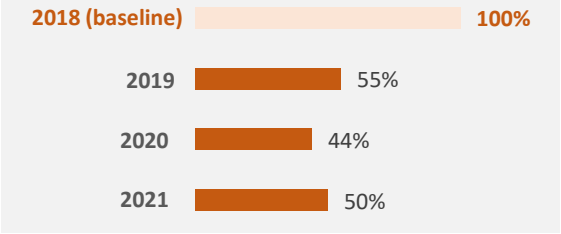
The measures are communicated using a number of tools [e.g., instructions and email newsletters to ship crews and marine operators, notices to mariners published by CCG, and navigation warnings issued by Marine Communications and Traffic Services (MCTS) centers]. Recognition events and various signs of appreciation are part of the promotion and awareness efforts for the slowdown measures. TC has a reimbursement program to help offset the economic impacts of measures to some mariners (e.g., for increased pilotage costs). Compliance with measures is monitored through aerial and acoustic surveillance, AIS data from CCG (MCTS), as well as a public mapping tool based on self-reported data called Oceana Ship Speed Watch.

Data shows that the pilot for voluntary slowdown measures has been promising:

The participation rates of vessels in voluntary slowdown trials increased from 2019 to 2021, on both the West and East coasts.[31]



Compared to the baseline noise reduction level achieved in the 2018 trial on the West coast, the underwater noise level was further reduced in 2019, 2020 and 2021 slowdown trials.

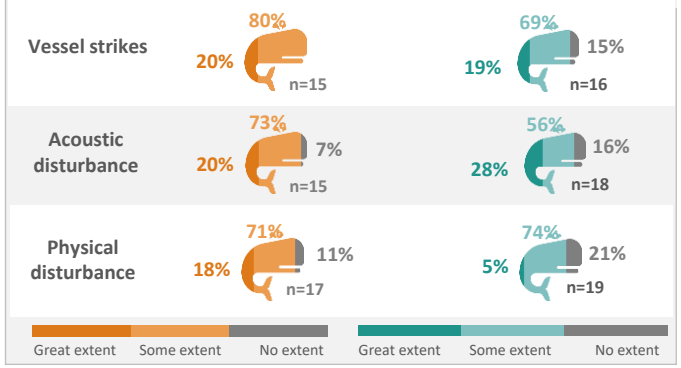


There were some challenges and factors that had an impact on the success of voluntary slowdown measures

- Economic factors and related push-back and lack of compliance from industry.
- Lack of capacity to monitor and enforce compliance, specifically for small vessels.
- Gaps in knowledge of whale distribution and presence in Canadian waters.
- Limited scientific evidence of the optimal speeds and the benefits from the measures.

Despite challenges regarding compliance, in situations where Canada has no authority to establish mandatory measures (e.g., in shared waters), voluntary slowdown measures could improve area coverage and overall effectiveness.

Internal and external survey respondents believed that some progress has been made as a result of voluntary slowdown measures to mitigate some threats.



[30] On the Pacific coast, the ECHO Program is responsible for the implementation of measures in Haro Strait and Boundary Pass, as well as Swiftsure Bank; whereas TC manages the Cabot Strait measure on the Atlantic coast.

[31] Given that the trials are managed differently and are taking place in different conditions, participation rates on the West and the East coast should not be compared and should be interpreted separately for each location.

Appendix C: Summary of activities examined in-depth (continued)

B) Marine mammal response providers

DFO is responsible for assistance and incident response to marine mammals in distress, including whales. The department relies on networks of external partners[32] (e.g., other governments, conservation groups, non-governmental organizations) with specialized expertise, as well as on internal partners such as DFO's Conservation and Protection and CCG. The marine mammal response activities on the oceans (e.g., monitoring marine mammals in distress; tracking marine mammal entanglements, strandings, ship strikes and other threats; and incident response involvement of appropriate partners) are coordinated and supported by these networks, including national and regional marine mammal coordinators.

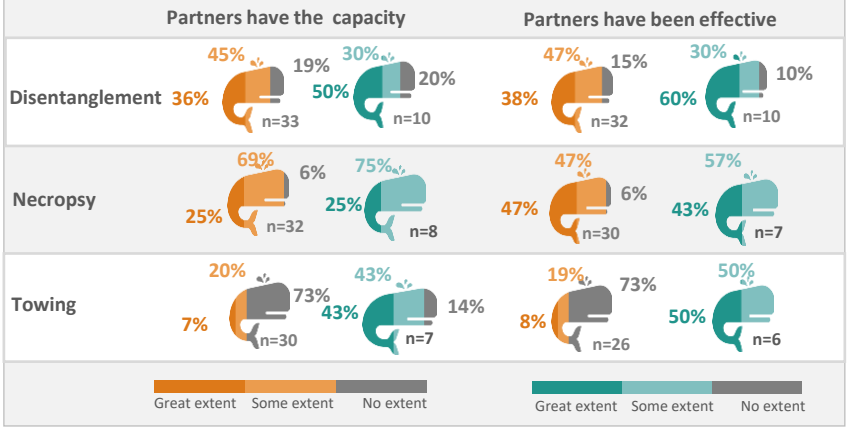
In 2018, annual, ongoing funding of $1.0 million was provided to stabilize response operations and $4.5 million over four years was provided to augment marine mammal response capacity, both in the regions and nationally. The increased responsibilities of the dedicated whale team included:

- improving response protocols and procedures to ensure safety of responders;
- supporting and liaising with contractors with expertise in response activities such as entanglement, and necropsies.
- implementing a training program and properly equipping third-party regional responders, including Indigenous communities and groups, and fishery officers, to provide response support safely; and
- updating the Marine Mammal Regulations in the *Fisheries Act* and supporting compliance with the US *Marine Mammal Protection Act.*


Photo credit: DFO Photo Bank

From 2018-19 to 2021-22, DFO engaged with three organizations on disentanglement activities ($1.2M funding) and thirteen organizations on activities and/or services related to marine mammal response ($2.0M, which was administered through contribution agreements.

Internal and external survey respondents believed that the external partners have the capacity and have been effective providing disentanglement and necropsy response. However, internal survey respondents believe that there are challenges with towing.



Challenges and factors impacting emergency response to whales

The following key challenges and impacting factors were identified:

- interaction with other program priorities;
- gaps in surveillance data;
- insufficient training for DFO staff;
- lack of clarity on roles and responsibilities, particularly for DFO Conservation and Protection teams;
- insufficient internal capacity to coordinate response and external engagement, which is more prominent on the Atlantic coast due to the different model for marine mammal response provision and coordination across several provinces and DFO regions; and
- insufficient funding support to external partners for succession planning and training.

[32] These partners include Quebec Marine Animal Emergency Response Network, Whale Release and Strandings (Newfoundland and Labrador), British Columbia Marine Mammal Response Network, Campobello Whole Rescue Team, Marine Animal Response Society, Canadian Wildlife Health Cooperative.

Appendix C: Summary of activities examined in-depth (continued)

C) Whale-related aerial surveillance for NARW

Several DFO and TC programs conduct aerial surveillance as part of ongoing work and core responsibilities:

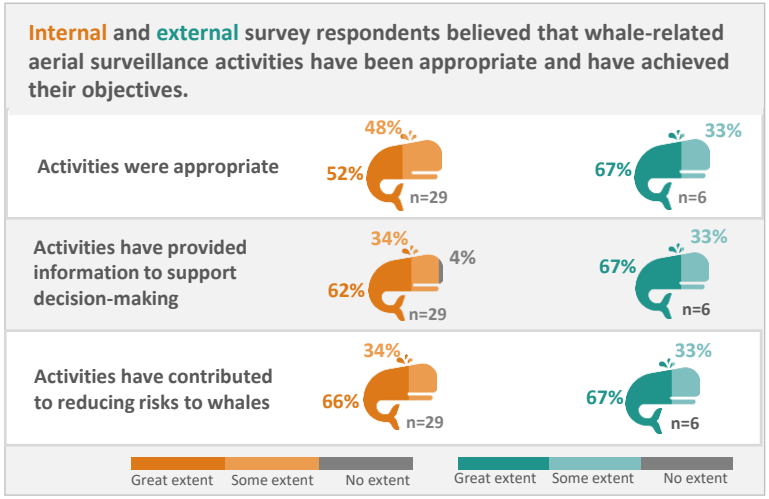
- TC's National Aerial Surveillance Program (NASP) for marine safety and security;
- DFO's Ecosystems and Oceans Science for systematic science survey data collection and resource management; and
- DFO's Conservation and Protection (C&P) Fisheries Aerial Surveillance and Enforcement (FASE) program for monitoring compliance with fishery measures and regulations.

Whales were surveyed prior to 2018; however, it was not done systematically. The whale initiatives provided funding for additional whale-related aerial surveillance, including the purchase and refurbishment of an additional airplane, testing new technology for aerial surveillance [TC's Remotely Piloted Aircraft System (RPAS)], and additional aerial surveillance staffing positions and flight hours. There has been limited aerial surveillance of SRKW and most aerial surveillance efforts have been directed at NARW given their broader range and sightability.

Flights were planned and coordinated daily by DFO and TC, based on factors such as weather, emergencies, or operational priorities. As of 2021, a Marine Mammal Platform Coordinator from DFO C&P acts as an interdepartmental liaison to ensure accurate coverage, needs prioritization, and the efficient use of assets. NARW-focused aerial surveillance was prioritized as an essential activity during COVID-19 because it supported the Canadian economy, food source from fisheries, and conservation priorities.

Aerial surveillance data for whales was disseminated and supported the implementation of whale-related measures or operations. Other partners provided input on aerial surveillance (e.g., NOAA, Grand Manan whale and seabird group, New England Aquarium, and the Canadian Whale Institute).

DFO and TC data showed a total of 10,682 hours of whale detection (2018-19 to 2021-22. While these hours were logged as a results of the whale-related funding, they do not accurately reflect all whale-related surveillance efforts because whale presence surveillance is done on most flights (either as a main or a secondary task, rarely as the only task). However the reporting systems do not capture this level of detail.



It was noted that:

- aerial surveillance is the most effective tool to know the location of whales (thus, the risks), so dynamic management measures (e.g., vessel traffic slowdowns or fishery closures) can be timely triggered;
- it is the surveillance method with lowest impact to wildlife, most flexibility, and largest coverage; and
- systematic aerial surveys provide the best data possible to develop habitat models for NARW.

Challenges and factors impacting whale-related aerial surveillance

Two key aspects emerged and are summarized as follows:

- interaction with other program priorities could be improved, mainly for C&P and scientific priorities and needs; and
- there are limitations related to collecting, managing, sharing, and using surveillance data (e.g., different teams collect and report surveillance data differently; thus, data is often not consistent with other data sets or not useful for the other teams; or it is cumbersome to share because of different formats or security issues).

Appendix C: Summary of activities examined in-depth (continued)

D) Whalesafe fishing gear/technologies

Entanglements are a high-risk threat for whales, especially for NARW passing through busy fishing areas. To reduce harm to large whales from fishing activities, DFO undertakes activities related to:

- prevention (e.g., removing and reducing fishing gear and rope in areas of whale presence or aggregation);
- alleviation (e.g., reducing the severity and duration of the entanglements by fishing gear modifications allowing whales to escape easier); and
- response (e.g., assisting large whales in distress, in coordination by the Marine Mammal Response Program).

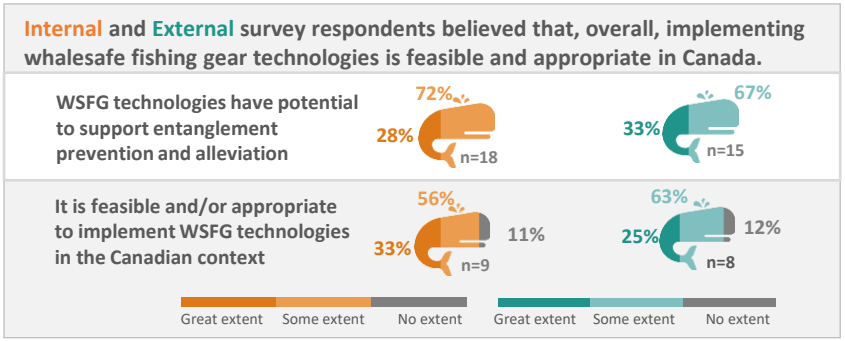
In 2020, DFO announced the objective to implement new requirements for fisheries in Atlantic Canada and Quebec to adopt gear modifications to address entanglement risks. To support the implementation, DFO launched the Whalesafe Gear Adoption Fund (WSGF) [33], providing $20M in contribution funding over two years for projects that advance the adoption of existing whalesafe gear, devices, and systems in commercial fisheries.

33 WSGF projects

$19 M

Number of projects	Funding	Type
13	$5.9M	Low breaking-strength (weak) ropes[34]
11	$4.5M	Ropeless or rope-on-demand systems[35]
9	$8.6M	Other trials related to whalesafe fishing[36]

It was noted that some industry associations and NGOs had experienced challenges with regards to the access to the funding (often announced on short notice), and the rigorous application and reporting process and timelines. It is still too early to assess the extent and capacity of tested technologies, the costs, the economic impact to fisheries, and the potential support needed.



Additional context was gathered from Canadian and international practices:

- Ropeless and rope-on-demand fishing gear systems are currently widely tested and regarded in Canada, the United States, and Australia. According to some studies, they may reduce the risk of entanglement by 90%.
- Weak rope gear modifications could help alleviate consequences of entanglements; however, could increase the risk for lost gear. Electronic monitoring systems and visualization tools would help addressing this risk.
- The ropeless release systems should also be used for hydrophones studying whales as these are used in areas where whale presence is more likely than in areas where fishery operations occur.
- Some technologies that have been successfully implemented elsewhere (e.g., in shallow fisheries) may not work in Canada where sea and weather conditions are more challenging and varied.

Challenges to the implementation of the upcoming new regulations

- Knowledge of the new technologies and their risk reduction effectiveness.
- Resistance from fisheries (e.g., many are not convinced that their operations may cause risk to whales, NARW not present in some areas).
- Short time to adopt modifications and high extra costs for fisheries.

[33] https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/whales-baleines/gear-equipement/guidelines-lignes-directrices-eng.html.
[34] Low breaking-strength ropes or weak components that would break at 1700 pounds of force to alleviate entanglements, which is consistent with NOAA's regulations for endangered species.
[35] Emerging technologies in trial, such as: buoy and marking systems, on-demand acoustic release technology, and virtual gear mapping, to replace floating ropes linked to floating buoys.
[36] Examples include: testing multiple types of whalesafe gear in specific conditions, supporting fish harvesters to participate in trials through a gear-lending program or cost-sharing approach.

Appendix C: Summary of activities examined in-depth (continued)

The views, observations, and suggestions provided by internal and external experts, who responded to the open-ended survey questions specific to each of the four examined activities, are summarized below.

Are there any best practices, lessons learned, or innovative solutions that could be considered with regards to voluntary slowdown measures?

- Ensure good collaboration, early engagement of stakeholders, and public outreach.
- Make measures mandatory instead of voluntary, based on visual and acoustic presence data.
- Evaluate risk reduction as a result of measures.
- Coordinate government efforts at the regional, national, and international level to address all aspects related to regional growth and increased vessel traffic.

Are there any best practices, lessons learned, or innovative solutions that could be considered with regards to whale-related aerial surveillance?

- Continue aerial surveillance and consider what is needed to leverage existing assets (e.g., determining parameters and additional requirements, getting approvals and resources). Although it is expensive and limited by weather conditions, aerial surveillance has provided some of the most comprehensive data in time and space.
- Consider innovative technologies such as autonomous long-range RPAS and automatic detection of whales on aerial or satellite imagery in order to improve effectiveness and reduce costs.
- Continue the joint planning and coordination of flights and address the areas where further improvement is needed (e.g., better information sharing, reduction of cost and increase of safety).
- Implement consistent survey design, data collecting and data storing protocols to improve the coherence and usefulness of the aerial surveillance data.
- Coordinate with the United States, as well as expand the coverage on the Atlantic coast.

Are there any best practices, lessons learned, or innovative solutions that could be considered with regards to whales' emergency response (e.g., disentanglements, towing, necropsy)?

- Use innovative technologies and solutions for surveillance and for assisting disentanglement operations (e.g., drones, satellite data).
- Involve universities in necropsies to promote best practices and leverage their specialized expertise.
- Develop safe and effective at-sea sampling protocols for evaluating floating carcasses.
- Use standing offers for certain external expert groups (e.g., towing) to facilitate timely response and address capacity challenges.
- Look to the Pacific model for examples of possible improvements to the marine mammal response coordination, wherever appropriate.
- Continue the efforts to promote and support entanglement prevention, given that less than half of the entanglements could be detected or could be successfully assisted

What would be required to support fishing technology regulations in Canada (e.g., framework, tools, mechanisms, guides)?

- Ensure meaningful, timely, and open discussions, involving government, indigenous communities and groups, fishing industry, marine mammal scientists, local communities, industry partners and non-governmental organizations.
- Develop a strategic framework to clarify the objectives, activities, information needs, and roles of regional and national sectors.
- Have a flexible transition approach, which is based on area-specific science advice and risk assessment, and provides multiple gear modification options (e.g., by type of fisheries, by location).
- Offer financial and other support to offset the economic implications.
- Provide sufficient time for the implementation.
- Implement measures to ensure compliance with regulations and effective fishery management (e.g., robust electronic capacity for detecting appropriate gear sets).

Appendix D: Acts relevant to whale-related programming

Acts relevant to whale-related programming are:

Fisheries Act

The *Fisheries Act* empowers DFO and ECCC to manage, protect and conserve Canada's fisheries, including whales. It includes provisions prohibiting any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat. It includes provisions prohibiting any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat. The *Marine Mammal Regulations* created under the Act regulate human interactions with marine mammals, including disturbances.

Oceans Act

Under the *Oceans Act*, DFO manages human activities within or affecting marine ecosystems, and is able to address challenges facing the oceans, such as oceans health, marine habitat loss, and declining biodiversity. The CCG has the responsibility for safe, economical, and efficient movement of ships in Canadian waters through the provision of aids to navigation marine communications and traffic management services, and other services.

SARA

The *Species at Risk Act* (SARA) aims to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides for the legal protection of wildlife species and the conservation of their biological diversity. It includes provisions against the harming, harassing or killing of individuals, and/or the destruction of any part of their critical habitat.

CNMCAA

The *Canada National Marine Conservation Areas Act* (CNMCAA) holds PC responsible for the administration, management and control of marine conservation areas, including the establishment of a management plan that includes a long-term ecological vision for the marine conservation area and provision for ecosystem protection.

CWA

The *Canada Wildlife Act* (CWA) allows for the creation, management and protection of wildlife areas by ECCC for wildlife research activities, or for conservation or interpretation of wildlife. The purpose of wildlife areas is to preserve habitats that are critical to wildlife species, particularly those that are at risk.

CNPA, SSLMPA

The *Canada National Parks Act* (CNPA) and *Saguenay-St. Lawrence Marine Park Act* (SSLMPA) give PC the responsibility for ensuring that Canada's national parks, historic sites and related heritage areas are protected and presented for current and future generations, stating that the minister's first priority in the management of parks must be the maintenance or restoration of ecological integrity.

CEPA, 1999

The *Canadian Environmental Protection Act, 1999 (*CEPA) contributes to sustainable development through pollution prevention. It covers activities related to the assessment and management of risks from chemicals, polymers and living organisms; air and water pollution, hazardous waste, air pollutant and greenhouse gas emissions; ocean disposal and environmental emergencies.

CSA, 2001

The *Canada Shipping Act, 2001* (CSA) is the principal piece of legislation governing the operation of Canadian vessels everywhere as well as foreign vessels in waters under Canada's jurisdiction. It governs safety of marine transportation and recreational boating, as well as protection of the marine environment. The CCG has a responsibility to promote safe and efficient navigation and environmental protection.